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EDITORIAL

Cost Effective Preoperative Evaluation

The very object of preoperative assessment for patients undergoing surgical procedures and aneasthesia is to evaluate and apply measures to prepare higher risk patients for surgery as needed. But to achieve effectiveness, the clinicians concerned should be able to understand the risk connected with the particular type of proposed surgery and anaesthesia and link this risk to the patient's underlying acute and chronic medical troubles.

Both surgery and anaesthesia has its individual 'assault value' and consequence. To modify the body's response favorably to the patient and eliminate morbidity, relevant information about the patient's medical history and physical and mental conditions is always essential. It helps to determine which tests and consultations are needed for managing patient's perioperative care in light of effectiveness and minimum expense. Reduction of anxiety and informed consent should not be overlooked at the time of preoperative evaluation. Recovery occurs more quickly when the anesthesiologist allays the patient's concerns by discussing techniques and plans including that of postoperative analgesia.[1-4]

The practice of seeing patients preoperatively by an anaesthesiologist *just* before surgery still exists in this part of the world and yet a fair number make their way to OR without being seen at all. Globally, methods of preoperative evaluation are changing. In response to these changes, The American Society of Anesthesiologists (ASA) has developed a practice advisory for preanaesthetic evaluation. [5]

These changes signify that perioperative care must have its predictability and comprehensiveness so that no aspect of care is ignored to produce problems later. The change also gives guideline to achieve efficient and cost-effective preoperative care to save resources and time. Taking preoperative medical and surgical condition into consideration, the exact choice of laboratory tests, useful patient edification, produces a satisfying surgical outcome. Optimizing patient health before surgery and planning the most appropriate perioperative management plan improve outcome and reduce costs. There are studies supporting these claims. These studies done over four decades repeatedly indicated that patient's preoperative condition has the ultimate influence over postoperative morbidity.[5-11]

The studies recommended the preoperative evaluation should be done several weeks before the operation. This provides adequate space for preparation which may include further consultation(s), investigations and treatment. It becomes binding to the assessor to assess the patient through thorough history and be guided to identify the potential risk and to ask for laboratory tests that will be beneficial in planning perioperative care. Indeed, the American Society of Anesthesiologists (ASA) graded preoperative patients in terms of medical conditions and possible perioperative outcome. This provided latitude to the perioperative physicians (Anaesthesiologists) to optimize patients for choosing appropriate anaesthetic technique for the proposed surgery. [12,13]

In US, preoperative laboratory work up once routinely included a complete blood count, extensive blood chemistry profile, urinalysis, prothrombin time, partial thromboplastin time, electrocardiogram (ECG) and chest radiographs. Numerous studies have subsequently shown that most of these tests were ordered without a clear indication, and that only a very small percentage of the results were unexpectedly abnormal. Even among the small percentage of patients with unexpected abnormal results, management was unaffected. Current recommendations call for fewer routine tests and for selective ordering of laboratory tests based on the specific indications in a given patient. In addition, the availability of previous laboratory testing can obviate the need for additional preoperative tests.

After all if these extra tests are not doing any benefit then why one should increase the expense. This made an impact in the mind of clinicians of affluent countries and that has reached us too here in third world. The studies showed that unindicated testing may lead physicians to treat borderline and false-positive laboratory abnormalities. Roizen et al [14] in one of his

retrospective study examined the adverse effects of chest radiographs on patients and concluded that routine chest radiograph for patients whose history and clinical examinations do not suggest any disorder has a high cost benefit ratio To work out benefit -risk ratio review and analysis of literatures become necessary. Tests selected rationally by clinicians are likely to be more beneficial than risky for their patients. [12, 15-17] and that harm from false positives is 6/100.[18,19] Studies also revealed that patients undergoing minor or minimally invasive surgery after a careful medical history was obtained have little to benefit from more testing.[5,11,12]

Specific issues like patients with cardiac ailments, respiratory disorders, renal insufficiency, chronic liver disease, diabetes mellitus or any condition that may influence anaesthetic technique and alter surgical outcome should be addressed with a set protocol. Most of the hospitals have their own guideline regarding this. It is the job of preoperative assessor to determine the requirement of degree of consultation with the Physicians of different disciplines to optimize patient's condition for anaesthetic and surgical intervention.

It is also important to make the preoperative evaluation cost effective for the establishment, the tax payers and the patients. Roizen has pointed out in his reviews

(1989 & 2005) the very importance of proper evaluation with minimum tests which ultimately becomes 'purse friendly' to all concerned.[20,21] A summary of the proposal is outlined below.

Summary of Recommended Preoperative Laboratory Tests Depending on the History and Physical Findings

Condition	Indicated testing and other measures*
Healthy patient	
<= 40 years	Hemoglobin, urine screening for pregnancy in women of childbearing potential
> 40 years	Add ECG and blood glucose (age >=45 years)
Cardiovascular disease	ECG, chest radiographs, hemoglobin, electrolytes, BUN, creatinine, glucose (age >=45 years or history of diabetes)
Recent MI (<=6 weeks), unstable angina, decompensated CHF, significant arrhythmias, severe valvular disease	Cardiology consultation
Previous MI (>6 weeks ago), mild stable angina, compensated CHF, diabetes mellitus	Stress test if high-risk procedure or patient has low functional capacity; consider assessment of left ventricular function (i.e., echocardiography)
Rhythm other than normal sinus rhythm, abnormal ECG, history of stroke, advanced age, low functional capacity	Stress test if high-risk procedure and patient has low functional capacity
Pulmonary disease	Chest radiographs, hemoglobin, glucose (age >=45 years), ECG (age >40 years); provide patient with instructions for incentive spirometry or deep-breathing exercises
Asthma	Pulmonary function testing or peak flow rate to assess disease status
COPD	Consider pulmonary function testing and arterial blood gas analysis for assessment of disease severity
Cough	Evaluate for etiology
Dyspnea	Evaluate for etiology
Smoking	Counsel patient to stop smoking 4 to 8 weeks before surgery
Obesity	Provide patient with instructions for incentive spirometry or deep-breathing exercises
Abdominal or thoracic surgery	Provide patient with instructions for incentive spirometry or deep-breathing exercises
Malnutrition	Laboratory tests based on primary disease, plus albumin and lymphocyte count; if malnutrition is severe, consider postponing surgery and providing preoperative supplementation

ECG = electrocardiogram; BUN = blood urea nitrogen; MI = myocardial infarction; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease.

National Institute for Health and Clinical Excellence, UK, in its compilation of guidelines in 2003 edition has addressed the issue with great elaboration and the requirement of lab tests has been recommended on the basis of two grades. ASA grade and Surgery grade which are as follows.

Surgery grades

Grade 1 (minor) Excision of lesion of skin; drainage of breast abscess

Grade 2 (intermediate) Primary repair of inguinal hernia; excision of varicose vein(s) of leg; tonsillectomy/adenotonsillectomy; knee arthroscopy

Grade 3 (major) Total abdominal hysterectomy; endoscopic resection of prostate; lumbar discectomy; thyroidectomy

Grade 4 (major+) Total joint replacement; lung operations; colonic resection; radical neck dissection

Neurosurgery –

Cardiovascular surgery–

ASA grades

ASA (American Society of Anesthesiologists) grades are a simple scale describing

fitness to undergo an anaesthetic. The ASA clearly states that it does not

endorse any elaboration of these definitions. However, anaesthetists in the UK

often qualify (or interpret) these grades as relating to functional capacity – that

is comorbidity that does not (ASA Grade 2) or that does (ASA Grade 3) limit a

patient's activity

ASA Grade 1 "Normal healthy patient" (that is without any clinically

important comorbidity and without clinically significant

past/present medical history)

ASA Grade 2 "A patient with mild systemic disease"

ASA Grade 3 "A patient with severe systemic disease"

ASA Grade 4 "A patient with severe systemic disease that is a constant threat to life"

The detailing of the protocol is beyond the scope of the present editorial but its is readily available on the following web address. www.nice.org.uk/CG003 [28]

(J Bangladesh Coll Phys Surg 2010; 28: 69-72)

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22. www.nice.org.uk/CG003

Maternal Anthropometry and Intrauterine Growth Retardation (IUGR) - A Hospital Based Study

B DHAR[a], KJ HOSSAIN[b], MSK BHADRA[c], A MOWLAH[d], G MOWLAH[e]

Summary:

This was a prospective observational study conducted on 374 pregnant women who remained in the study beginning from first trimester until gave birth to singleton newborn babies selected from five maternity hospitals located at different regions in the country over a period of thirty months from July 2002 to December 2004. Objectives of the study were: (1) To find out the incidence of IUGR in the hospital based study, (2) To observe the impact of pre-pregnancy weight and pregnancy weight gain on IUGR, (3) To select appropriate cut off points of pre-pregnancy weight and pregnancy weight gain to identify women at risk for delivering IUGR babies and (4) To observe the association between socio-demographic factors and maternal anthropometry.

Twenty one percent women delivered IUGR babies. Mothers who gained <4 kg in second trimester and <5kg in third trimester gave birth to significantly higher incidence of IUGR babies (29.1% and 35.3% respectively) in comparison to mothers gained e" 4 kg and e" 5 kg who gave birth to 14.4% and 9.3% IUGR babies (p<.001) . Maternal weight for height in the lower range of normalcy at early pregnancy was associated with an increased risk of IUGR when compare to normal or over weight for height group of mothers (30.6% vs. 9.5%; p=<.001). The study revealed that combination of <90 percent of standard weight for height and net weight gain per week <125gm have strong negative influence on foetal growth (39.5% IUGR babies). On the contrary, combination of e" 110 percent of weight for height and weekly weight gain of e" 150 gm have significant positive impact on foetal growth (6.7% IUGR) . For total weight gain, best cut off point for identifying risk women of delivering IUGR babies was recommended 8.5 kg and that for prepregnancy or first trimester weight was 47.5 kg.

Key words: Low birth weight, intrauterine growth retardation, Anthropometry

(J Bangladesh Coll Phys Surg 2010; 28: 73-80)

Introduction:

The birth weight of newborn baby is probably the most important factor that affects the future survival and quality of life[1-4]. It is also a significant determinant of post neonatal, infant and childhood mortality as well as morbidity[4-5]. For these reason, birth weight has long been a subject of clinical epidemiological investigations and an area of public health interest. In particular, considerable attention has been focused on the causal determinants of birth weight, especially of low birth weight (LBW), for identifying the potentially modifiable factors. Birth weight is governed by two major processes: duration of gestation and intrauterine growth retardation (IUGR). LBW is thus caused by either a short gestation period or retarded intrauterine growth (or combination of both)[6]. Most of the LBW in industrialized countries is due to pre- term (<37 weeks of gestation) birth, while majority of LBW in developing countries is due to IUGR[7-8]. The concept of classification of infants into risk groups (IUGR groups) according to birth weight and gestational age first emerged with the publication of intrauterine growth standards in 1963[9]. Since then several standards have been published in different countries[10-11].

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Premature infants and IUGR infants should be studied as separate groups, because they show different patterns of growth, morbidity and mortality. Infants who are growth retarded have higher rates of long-term developmental or physical morbidities, including growth deficiencies. On the other hand, infants who have grown at appropriate rates during gestation, but are born early have higher rates of neonatal mortality and infectious disease mortality during infancy, but if they survive, exhibit fewer long-term developmental abnormalities[12-13] From a programmatic viewpoint these differences have enormous implications for intervention strategies and limitations of the approach of nutritional recovery of IUGR infants in early childhood[14-15].

In Bangladesh, incidence of LBW is unacceptably high[8,16-20]. And majority of these LBW babies is due to IUGR. Moreover, among normal weighing babies (e"2.5 kg) certain percentage might suffer from growth retardation and there would also be a proportion of infants who are both growth retarded and preterm, and these babies would be at high risk of neonatal mortality and subsequent developmental and physical morbidities. If we consider these issues as well, it can easily be assumed that incidence of growth retarded infants is higher than LBW infants in the country. But unfortunately, no study has yet been conducted to identify the incidence as well as determinants of IUGR.

From many studies in developed and developing countries it is observed that maternal nutritional factors (as estimated from maternal anthropometry) play significant role for the occurrence of IUGR[6]. Therefore, the primary objective of the present study is to find out the incidence of IUGR and to observe the association between IUGR and maternal nutritional factors in terms of maternal weight. To observe the distal or indirect effect of socio-demographic factors on IUGR, relationship between maternal anthropometry and socio-demographic factors is also attempted to examine.

Materials and method:

This was a prospective observational study conducted on pregnant women beginning from first trimester until delivery at four district level Mother and Child Welfare Centres (MCWC) and Ad-din hospital at Dhaka to examine the relationship between maternal modifiable factors and intrauterine growth retardation. The four MCWCs are located at Comilla, Pabna, Bogra and Jamalpur. These are government maternity hospitals. Comprehensive essential obstetric care (EOC) services (including caesarian section and blood transfusion) are provided from these centers since 1995. There are 98 such centers in the country, out of which 63 centres are located at district head quarter. Doctors and paramedics are well trained from medical college hospitals. Sophisticated equipments are provided in each center by UNFPA. Record keeping system is unique in these centres. Anthropometric measurements are taken correctly. As these centers are located at district head quarter, urban, periurban as well as rural women have the scope to enjoy the facilities of these centers. To ensure quality data, the investigators decided to collect data from such four centers. Four centers were selected randomly. In addition to government facilities at district level, investigators also selected a similar non-government hospital at Dhaka metropolitan city. This is Ad-din hospital, a specialized maternity hospital located at the centre of the city (Mag bazaar area). Obstetric services are provided by specialist doctors. All relevant maternal information is properly recorded in this institute. As the hospital is not an expensive one, in addition to socio-economically better off women, large number of middle and lower class pregnant women also usually attend this hospital for antenatal care and delivery service.

Data were collected over a period of 30 months from July 2002 to December 2004.

Pregnant women who attended selected MCWCs and Ad-din hospital for ante natal care from first trimester of pregnancy (at or before 12 weeks of gestation), comprised the study population. Among the study population who joined the study from the early stage of pregnancy, also attended the centres at mid pregnancy (20 to 24 weeks of pregnancy) and finally gave birth to normal singleton baby in these centres were the study subjects of the study. A total of 2055 pregnant women were booked initially at the early stage of pregnancy but at the final stage of data colection, three hundred and seventy four women delivered singleton live birth newborns in the selected service centres and these 374 mothers and their newborns were taken as the study subjects. Subjects who gave birth to still born babies ,multiple pregnancies and pregnant women who had any medical complication (e.g. diabetes mellitus, high blood pressure, heart disease, chronic lung disease, jaundice

and other debilitating diseases) were excluded from the study.

Intrauterine growth retarded newborns were classified according to weight for gestational age standards developed by Lubchenco et al[9]. Thus, 295 (79 percent) babies were found non- growth retarted or normal and 79 (21 percent) were found growth retarded.

Data were collected through interviews by paramedics under direct supervision and monitoring of doctors of the centres. Initially investigator (first author) visited all the centres and trained the doctors and paramedics of the centres about data collection technique. The subjects were informed about the nature of the study and consent was taken from them. Information about certain socio-demographic characteristics (age, education, monthly family income and occupation) and anthropometric measures were recorded through the structured questionnaire. To ensure quality data collection, the investigators visited each centre at two weeks interval and checked each and every filled up questionnaire. Any inconsistency which was identified either was discarded or if practicable, corrected. Thus no inappropriate data was included in the sample. Though information on socio-demographic characteristics was recorded, these variables were not used in the analyses to examine their relationship with IUGR. However, effort was under taken to examine the association between socio-demographic variables and maternal anthropometry in order to identify whether there is any indirect relationship existing between these variables and intrauterine growth.

Mothers' and babies' anthropometric parameters were recorded according to standardized techniques as described by Jellife and Jellife[21]. Mothers' weight measurements were undertaken at booking time (at or before 12 weeks of gestation), at second trimester (20-24 weeks of gestation) and at term (before delivery). Body Mass Index (BMI) was calculated from weight and height. Immediate post partum weight of the women and anthropometric measurements of newborns (weight, head circumference, chest circumference and crown heel length) were recorded just after their birth. We identified total weight gain, second and third trimester weight gains to observe their effect on foetal growth. Like many other authors, weight at booking time was treated as prepregnancy weight. Percent of standard weight for height was calculated to assess the incidence of IUGR across various weight for height groups. We also emphasized to examine the association between net rate of maternal weight gain (instead of overall rate of weight gain) and intrauterine growth. Since weight gains are generally far smaller in the first than in the second and third trimesters, women with preterm deliveries will have had a lower overall rate of gain, on average than those delivered at term. Moreover, foetal weight increases exponentially, with highest gains in the third trimester, while the overall rate of maternal weight gain is fairly constant after the first trimester. Thus, with advancing gestation, the portion of overall gain attributable to maternal tissues and nutritional stores diminishes to that of increased foetal size. Associations between overall rate of weight gain and birth weight may therefore, reflect the effect of foetal growth, rather than maternal nutrition per se. Thus, it is logical to examine the relationship between net rate of weight gain and intrauterine growth. Net weight gain was calculated by subtracting immediate post partum weight from term weight and net rate of weight gain was calculated by dividing net weight gain by gestational age. We defined low net rate of weight gain as <125 gm/ week and normal as e"150gm/week. Besides we also defined low and normal net weight gains as < 4kg as e"4 kg. BMI was also categorized as low (<20) and normal (e" 20).

Data were analyzed using SPSS software (11.5 version). Chi-square test was carried to compare the differences in proportions. Sensitivity and specificity analysis was under taken to select appropriate cut off points of maternal weight gain and minimum prepregnancy weight for identifying risk women of delivering IUGR babies.

This study has certain limitations like many other studies. This is a hospital based study, so the findings of the present study can not be generalized. Another limitation of the study is that, those who did not participate or loss to follow up after initial booking, their pregnancy outcomes could not be compared with

those who completed their participation in the study. Thus, this non- participation group or loss to follow up group whether underestimated or overestimated the study result could not be ascertained. This study also did not include the elate group of women who usually give birth to their newborns at most modern and expensive hospitals and clinics. However, most of this elite group of women is most likely give birth to non-growth retarded babies; their absence from the study is not a major concern. Finally, no supplementation was given to the women to investigate the effect of qualitative and quantitative effect of food supplementation on pregnancy outcome. Therefore, inference cannot be drawn from this study about what type and what quantity of food supplementation is needed for the individual subject.

Results:

Low maternal weight gain both in second and third trimesters (<4kg vs. e" 4kg and <5kg vs. e" 5kg respectively for second and third trimesters) had significant effect (p<.001) on the prevalence of IUGR (TablesI&II). Influence of percent of standard weight for height both at first and third trimesters (at term) on IUGR was examined and presented in tables III and IV. It is observed that those mothers who were at < 90 percent of standard weight for height at first trimester gave birth to 30.6 percent IUGR babies and those who were e" 110 percent of standard weight for height at the beginning of pregnancy delivered only 9.5 percent of IUGR babies. Similarly, at term who attained <100 percent of standard weight for height delivered 29.6 percent of IUGR babies and who attained e" 110 percent of standard weight for height gave birth to only 6 percent IUGR babies(p<.001).

Table-I

Maternal weight change between 1st and 2nd trimesters and incidence of IUGR

Weight change between 1st and 2nd trimester	No. of cases	Non-IUGR and IUGR babies	
		Non-IUGR %	IUGR %
< 4kg	172	70.9	29.1
e" 4kg	202	85.6	14.4

χ^2 -12.0, (df- 1, p<. 001)

Table-II

Maternal weight change between 2nd and 3rd trimesters and incidence of IUGR

Weight change between 2nd and 3rd trimester	No. of cases	Non-IUGR and IUGR babies	
		Non-IUGR %	IUGR %
<5kg	170	64.7	35.3
e"5kg	204	90.7	9.3

χ^2 -35.5, (df- 1, p<. 001)

Table-III

Influence of maternal weight for height early in pregnancy (up to 12 weeks of gestation) on IUGR

Maternal weight for height in early pregnancy (percent)	No of cases	Non-IUGR and IUGR babies	
		Non-IUGR %	IUGR %
<90	134	69.4	30.6
90-99	99	76.8	23.2
100-109	66	87.9	12.1
e"110	74	90.5	9.5

χ^2 -16.7, (df- 3, p<. 001)

Table-IV

Influence of maternal weight for height at term on IUGR babies

Maternal weight for height at term (percent)	No of cases	Non-IUGR and IUGR babies	
		Non-IUGR %	IUGR %
<100	223	70.4	29.6
100-<110	83	89.2	10.8
e"110	67	94.0	6.0

χ^2 -24.0, (df-2, p<. 001)

Table V demonstrated that mothers whose net weight gain was < 125gm per week delivered 27.4 percent IUGR babies and those who gained e" 150 kg per week gave birth to 11.8 percent IUGR babies(p=<.005).

From the tables, so far presented it is revealed that maternal weight gain and first trimester weight status

(proxy of prepregnancy weight) have clear positive significant influence on foetal growth.

Table-V

Gestational net weight gain per week and its influence on IUGR.

Gestational weight gain per week (gm)	No of cases	Non-IUGR and IUGR babies	
		Non-IUGR	IUGR
		%	%
<125	215	72.6	27.4
125-<150	74	86.5	13.5
e”150	85	88.2	11.8

χ^2 -12.2, (df- 2, p<. 005)

Table VI explains the combination effect of maternal net rate of weight gain and percent of standard weight for height at early pregnancy on intrauterine growth. It is revealed that women who had initial weight for height less than 90 percent of standard and net weight gain was also less than 125gm per week gave birth to more than 39 percent IUGR babies. On the other hand, whose initial weight for height was e”110 percent and rate of weight gain less than 125 gm delivered 14 percent IUGR babies. Again, when initial weight was below 90 percent but rate of weight gain was either equal to or above 150 gm per week delivered 18.5 percent IUGR babies. Women with e”110 percent of weight for height who also gained e” 150 gm per week delivered only 6.7 percent IUGR babies.

When it is established that maternal prepregnancy weight and weight gain during pregnancy are the two most important determinants of IUGR, then another task is to find out the appropriate cut off points for prepregnancy weight and weight gain during pregnancy to identifying risk women for delivering IUGR babies.

From sensitivity and specificity analysis it is observed that, for predicting risk women of delivering IUGR babies the best cut off points for total weight gain and prepregnancy weight should be 8.5 kg and 47.5 kg respectively (table VII).

What relationship does exist between maternal anthropometry and socio demographic factors is presented in table VIII. It is obvious from the study that, socio-demographically better off women had higher mean anthropometric values for weight, height and BMI.

Table-VI

Incidence of IUGR by initial weight for height and weight gain per week.

Initial weight for height (percent)	No of cases	Weight gain per week (gm)					
		<125		125-<150		≥150	
		Non-IUGR (%)	IUGR (%)	Non-IUGR (%)	IUGR (%)	Non-IUGR (%)	IUGR (%)
<90	134	60.5	39.5	90.5	9.5	81.5	18.5
90-99	99	72.0	28.0	70.0	30.0	89.7	10.3
100-109	66	85.7	14.3	88.2	11.8	92.9	7.1
≥110	74	86.0	14.0	100.0	0.0	93.3	6.7

Table-VII

Sensitivity and specificity analysis for selection of cut off points of total weight gain and prepregnancy weight for IUGR.

Total weight gain (gm)	Sensitivity	Specificity	Positive predictive value	Negative predictive value	Odds ratio	95% confidence interval
<8000	62.0	76.9	41.8	88.3	5.4	3.1-9.5
<8500	73.4	63.0	34.7	89.8	4.7	2.6-8.6
<9000	75.9	56.6	31.9	89.8	4.1	2.3-7.6
First trimester weight						
<45	58.2	61.3	28.7	84.5	2.2	1.3-3.8
<47.5	76.0	51.2	29.4	88.8	3.3	1.8-6.1
<50	84.8	44.4	29.0	91.6	4.4	2.2-9.4

Table-VIII

Mean anthropometric values for different levels of socio-demographic characteristics of mothers.

Variables	First trimester weight (kg)	First trimester BMI (unit)	Height (cm)
Mothers' age			
<20	44.3	19.7	149.9
20-24	46.7	20.3	151.7
25-29	48.8	21.1	152.0
e" 30	50.1	21.5	152.4
Education			
none	41.2	19.2	147.7
Primary	44.1	19.6	149.9
Secondary incomplete	46.2	20.1	151.3
Secondary complete or more	49.4	21.2	152.6
Income			
<=3000/-	44.6	19.6	150.5
3000-6000/-	46.5	20.3	151.1
6000-9000/-	47.5	20.6	151.7
>9000/-	49.9	21.3	152.9
Family size			
2	48.5	21.3	150.5
3-4	48.3	20.9	152.0
5-6	46.6	20.2	151.7
≥7	46.9	20.2	151.9
Occupation			
Labour	44.3	19.6	150.0
Business	48.3	20.7	152.3
Service	47.7	20.7	151.8

Discussion:

Our study findings demonstrated that low maternal weight gain increases the risk of IUGR. Many other more or less similar studies also revealed the fact that, low total weight gain, low trimester weight gain, Low BMI, low weight for height increases the risk of IUGR and low birth weight. Smith reported that maternal starvation during the last two trimesters of pregnancy decreases average birth weight by 240gm; however the women he studied were exposed to severe famine[22]. We have observed in our study that, low weight gain in second trimester (<4kg) was associated with approximately double the risk of intrauterine growth retardation and four times the risk with low weight gain (<5kg) in third trimester. Reason for considering low weight as < 4kg and <5kg is that mean weight gain in our study at second and third trimesters were found to be about 4kg and 5kg respectively. Strauss R.S. and Diet W.H. in their study considered low weight gain as <0.3kg per week both for second and third trimester, and observed approximately double the risk of IUGR with low weight gain[23]. Abram and Selvin demonstrated that low maternal weight gain (<5.7kg) was associated with decreased birth weights ranging from 48 to 248gm depending on the pattern of weight gain in other trimesters[24]. Other two studies also confirmed that low prenatal weight gain significantly decreased the birth weight and increased the number of infants born with growth retardation[25&26].

Besides impact of weight gain on foetal growth, we also evaluated the influence of various combinations of weight gain and initial percent of standard weight for height on intrauterine growth. Weight gain was expressed as net rate of weight gain. The study revealed that combination of lowest weight gain (<125gm per week) and lowest percent of standard weight for height (<90 percent) responsible for highest risk (39.5 percent) of giving birth to growth retarded babies. On the contrary, women who gained 125 - <150gm per week and also had e"110 percent of standard weight for height delivered not a single IUGR babies (Table VI). In column 6 of table VI incidence of IUGR was found to be 0.0 at initial weight for height e" 110 and weight gain per week of 125<150gm, but reduction of incidence of IUGR in column 6 is inconsistence across the percent of initial weight for height. On the other hand in column 8 of the table it is revealed that there is gradual decrease of incidence of IUGR for mothers (who gained e" 150gm) whose initial weight for height gradually increases from <90 percent to e" 110 percent. Therefore, we concluded that mothers whose weight gain was e" 150gm per week and initial weight for height was e" 110 are the least risk group for giving birth to IUGR babies.

From the table we also observed that, women who began pregnancy with low weight for height (<90 percent) but weight gain was e"150gm per week and women who gained weight as <125gm per week but initial weight for height was above 110 percent had intermediate risk for giving birth to IUGR babies. This

important finding strongly supports the supposition of Garn that prepregnancy weight for height and pregnancy weight gain are independent and completely additive (and subtractive) in their effect on intrauterine growth[27]. Thus, it can reasonably be argued that low prepregnancy weight and low weight gain combinly seriously affect the foetal growth.

After establishing the role of weight gain and prepregnancy weight on IUGR, we attempted to find out the appropriate cut off points of weight gain and prepregnancy weight for identifying risk women who will most likely deliver IUGR babies. Sensitivity and specificity analysis was carried out to select appropriate cut off points. Sensitivity is defined as the ability to identify correctly individuals who have a specific condition, while specificity is defined as the ability to correctly predict individuals who do not have a specific condition. In table VII, three cut off points (8000, 8500 and 9000 g) of total weight gain was chosen to recommend the best total weight gain for prediction of IUGR babies in our country. At a cut off point of 8 kg-weight gain, among 79 IUGR babies, 49 can be identified. When the cut off point is raised to 8.5 kg, 58 cases of IUGR babies were identified; again at a cut off point of 9 kg the number is raised to 60. One should select such a cut off point for any indicator that identifies maximum number of the cases that one needs to identify. At the same time number of false positive cases should also be minimum so that overburden to the programme can be avoided. Taking in to consideration all these points we recommend a cut off point of 8.5 kg for weight gain below which a significant number of women are at risk of giving birth to IUGR babies. Similarly, for prepregnancy weight from the study finding, we recommend that a woman should be considered at risk for giving birth to IUGR babies when her prepregnancy weight was found to be less than 47.5 kg.

Anthropometric indicators are diagnostic or reflective indicators identify women with nutritional problems, but donot reveal the underlying cause or determinant of the problem or the best interventions to solve the problem. Therefore, we also attempted to examine the relationship between maternal anthropometry and sociodemographic factors to suggest appropriate intervention strategies for reducing incidence of IUGR and LBW. From table VIII, it is revealed that mothers of low socio-economic group (younger age, low income, no or minimum education, labourer group of husbands) have low mean anthropometric values for weight, height, and BMI. This finding leads us to think that though anthropometric indicators, particularly prepregnancy weight and pregnancy weight gain are the two most important determinants of pregnancy outcomes; these are only the proximal causes of the problem. The more distal, i.e. the underlying and basic causes in Bangladesh like other developing countries are the socio-demographic factors which include maternal age, house hold food insecurity, lack of maternal care, lack of access to quality antenatal and other health services, improper sanitation and hygiene, lack of education, gender discrimination etc. To improve the pregnancy outcomes in respect to both mother and baby the above mentioned basic causes should be addressed properly.

Conclusion:

To reduce the incidence of IUGR, short-term strategy should be towards the improvement of nutritional status of women before pregnancy or during pregnancy by providing adequate food supplementation and antenatal care services. It is recommended that for favourable pregnancy outcome, minimum prepregnancy or first trimester weight should be 47.5 kg and minimum total pregnancy weight gain should be 8.5 kg. The more important one is to uplift the socio-economic condition and socio-demographic characteristics of mass population particularly of women of reproductive age through multisectoral developmental approach for a sustainable improvement of maternal health and nutritional status through which incidence of IUGR can be reduced significantly.

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Efficacy of Intravenous Immunoglobulin in the Management of Guillain Barre Syndrome

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Summary:

A total number of 40 respondents consisting of 20 subjects of Guillain barre syndrome in each group treated with intravenous immunoglobulin (case) and without IVIg were selected during the study period. Out of 20 cases, 12 (60%) were male and 8 (40%) were females, ratio 1.5:1. Majority of the cases were presented at second or third decade of life. In control group, 11 (55%) were male and 9 (45%) female, ratio 1.22:1. Majority of the patients had history of upper respiratory tract infection or acute gastroenteritis 1 4 weeks preceding illness. All the patients had flaccid paralysis in all four limbs with some sensory features without bowel and bladder involvement. Thirteen patients from the case and control groups developed respiratory failure requiring ICU support. Cerebrospinal fluid study showed albumin cytological dissociation. Nerve conduction study showed features of demyelination, axonal loss or both.

There was significant improvement of GBS patients treated with IVIg in respect of respiratory function, muscle tone, muscle power, jerks and autonomic function. ICU stay of patients treated with IVIg was significantly shorter. Final outcome of patients treated with IVIg showed one death. There was no death in control group. The patient died probably due to severity of disease and/or comorbid disease.

Key words: Intravenous Ig, Guillain barre syndrome

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Introduction:

Intravenous immunoglobulin (IVIg) is a drug that has been used successfully with proven efficacy in the management of Guillain barre syndrome (GBS) in the developed countries. This drug is not manufactured in our country and has to be imported. Therefore, it is being used sporadically in few cases in our country since last 2 3 years by the affordable patients. So far, no case control study has been done in our country. Therefore, this study was designed to evaluate the efficacy of IVIg, feasibility of cost effectiveness of using this drug in our population. This will act as guideline for further study in large scale and consequently steps will be taken to make this drug easily available at lower cost in our country.

Guillain barré syndrome is an important cause of acute paralysis, yet the pathogenesis has still not been fully elucidated and specific evidence based consensus management guideline have not been developed[1]. Several recent studies have investigated whether there are any particular factor that might predict the course of illness and thereby dictate the optimal treatment. IVIg has been shown to have beneficial effect on the course of GBS.

Guillain barre syndrome is characterized by symmetrical flaccid ascending paralysis, areflexia and albuminocytological dissociation in cerebrospinal fluid (CSF)[2]. The disease may be difficult to diagnose at the onset, because of the characteristic changes of slowed nerve conduction and increased spinal fluid protein may be delayed. Early diagnosis is important as prompt intervention using plasmapheresis or IVIg can arrest or reverse the disease process[3].

Although the clinical term GBS has remained a convenient and useful designation, electrodiagnostic and pathologic studies indicate that there are different pattern with this syndrome. Most common is acute inflammatory demyelinating polyneuropathy (AIDP). Other varieties are acute motor axonal neuropathy (AMAN), acute motor sensory axonal neuropathy (AMSAN) and Miller Fisher syndrome (MFS).

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Approximately two third of the patients report preceding event, most frequently an upper respiratory tract infection (URTI) or gastrointestinal tract (GIT) infection, surgery or immunization 1 4 weeks before the onset of symptoms[4,5]. The agent responsible for the prodromal illness frequently remains unidentified. Specific infection linked to GBS includes cytomegalovirus (CMV), Epstein Barr virus (EBV), Varicella Zoster virus, hepatitis A&B, human immunodeficiency virus (HIV) and mycloplasma. The mode of common identifiable bacterial organisms responsible for GBS, particularly its axonal form is *Campylobacter jejuni*, a curved gram negative rod, which is a frequent cause of bacterial enteritis worldwide. Evidence of *C. jejuni* infection from stool culture or serological test was found in 26% patients with GBS admitted to hospitals in the United Kingdom[6].

Materials and Methods:

The present case control observational study was carried out in the Intensive Care Unit, Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, during January 2004 and June 2005.

Study design: This study consisted of the following components:

1) Selection of GBS patients based on criteria as mentioned below

   Features required for diagnosis

   a) Progressive weakness in both upper and lower limbs

   b) Areflexia

Features strongly supporting the diagnosis

   a) Progression of symptoms over days to 4 weeks
   b) Relative symmetry of symptoms
   c) Mild sensory symptoms or signs
   d) Cranial nerve involvement, specially bilateral weakness of facial muscles
   e) Recovery beginning 2 4 weeks after progression ceases
   f) Autonomic dysfunction
   g) Absence of fever at the onset
   h) Elevated CSF protein with <10/cells/cumm
   i) EDX features of nerve conduction slowing or block

2) Sampling technique: Stratified purposive sampling
3) Selection of patients indicated for IVIg therapy (a) severity of illness, and (b) economic status
4) Treatment given with IVIg within 2 weeks of illness
5) Dose of IVIg was 0.4 g/kg body weight/day for 5 days
6) Follow up patients after 15 days, 1 month and 3 months
7) Analysis of the results

Subjects: A total number of 20 GBS patients fulfilling the inclusion criteria were selected for this study as case and treated with IVIg, and 20 GBS patients who received only symptomatic treatment but did not receive IVIg were selected as control.

Methods: Detailed clinical examination, medical history, history of URTI, gastroenteritis, family history, thorough physical examination, pulse, blood pressure, cardiovascular and respiratory system were examined. Detailed neurological examination, including fundus examination were done. All information and findings were noted in predesigned data collection sheet. NCS and CSF studies were done.

Treatment modalities were symptomatic and IVIg within 2 weeks of GBS.

Collected data were compiled and appropriate statistical analyses were done using computerbased software (SPSS). P value <0.05 was taken as minimum level of significance.

Results:

Majority of cases had history of respiratory tract infection (60%), 30 percent diarrhoea, while in the control group, 55 percent had respiratory tract infection and 35 percent had diarrhoea. There is no significant difference of illness between case and control groups (Table I).

Improvement after treatment with IVIg was reviewed after 15, 30 and 90 days of treatment. There was significant improvement in respiratory function, muscle tone, muscle power, jerks and autonomic functions after 15, 30 and 90 days of treatment in case group in comparison with control group. Respiratory function

was assessed by forced vital capacity (FVC) and respiratory rate (Table II).

Improvement of muscle power after 90 days of treatment showed that 8 (40%) cases and 5 (25%) controls improved into grade IV, and three of the cases and one control improved into grade V, 7 (35%) cases and 4 (16%) controls were found in grade III. There was significant improvement in case group after 90 days of treatment in comparison with control group (Table III).

Muscle tone and jerks also improved after 90 days of treatment. After 90 days, muscle tone in 8 (40%) control group and 18 (90%) case group became normal. Jerks also improved to normal in 10 (50%) controls and 20 (100%) cases (Table IV).

On admission 9 cases and 5 controls were in ICU. After 15 days, none of the cases and one control group was in ICU. This value is statistically significant (P<0.05) (Table V).

Final outcome shows that after treatment with intravenous immunoglobulin, one (5%) case expired. There was no fatality in the control group. This may be due to severity of the disease and other comorbid condition (aspiration pneumonia) (Table VI).

Table-I

History of preceding illness (1 4 weeks)

Illness	Control (n-20)		Case (n-20)		P value
	No.	(%)	No.	(%)	
Diarrhoea	6	(30.0)	7	(35.0)	
Respiratory tract infection	12	(60.0)	11	(55.0)	>0.50^{ns}
Others	2	(10.0)	2	(10.0)	

Chi-square test, ns = Not significant

Table-II

Comparison of improvement between control and case

Improvement	Control (n 20)		Case (n 20)		P value
	No.	(%)	No.	(%)	
Respiratory function		(n 4)		(n 9)	
After 15 days	1	(25.0)	8	(88.9)	<0.05*
After 30 days	4	(100.0)	9	(100.0)	>0.10^{ns}
Muscle tone					
After 15 days	0		2	(10.0)	
After 30 days	5	(25.0)	15	(75.0)	<0.05*
Muscle power					
After 15 days	0		2	(10.0)	
After 30 days	7	(35.0)	18	(90.0)	<0.05*
Jerks					
After 15 days	0		3	(15.0)	
After 30 days	7	(35.0)	19	(95.0)	<0.05*
Autonomic dysfunction					
After 15 days	3	(15.0)	14	(70.0)	<0.05*
After 30 days	20	(100.0)	20	(100.0)	

Z test, ns = Not significant, * = Significant

Table-III

Improvement of muscle power after 90 days

Power	Control (n 20)		Case (n 20)		P value
	No.	(%)	No.	(%)	
G-0	0		0		
G-1	2	(10.0)	0		
G-2	8	(40.0)	2	(10.0)	<0.05*
G-3	5	(25.0)	5	(25.0)	
G-4	4	(16.0)	8	(40.0)	
G-5	1	(5.0)	5	(25.0)	

Chi square test, * = Significant

Table-IV

Improvement of other motor functions after 90 days

Motor functions	Control (n 20)		Case (n 20)		P value
	No.	(%)	No.	(%)	
Muscle tone	8	(40.0)	18	(90.0)	>0.05ns
Jerks	10	(50.0)	20	(100.0)	>0.50ns

Z test, ns = Not significant

Table-V

ICU stay for control and case

ICU stay	Control (n 5)		Case (n 9)		P value
	No.	(%)	No.	(%)	
Up to 7 days	5	(100.0)	9	(100.0)	<0.05*
Up to 15 days	4	(80.0)	4	(44.4)	
More than 15 days	1	(20.0)	0		

Z test, * = Significant

Table-VI

Final outcome of treatment

Outcome	Control (n 20)		Case (n 20)	
	No.	(%)	No.	(%)
Survived	20	(100.0)	19	(95.0)
Expired	0		1	(5.0)

Discussion:

This was an observational study which included 40 subjects. The study population was equally divided in two groups. One was control group having GBS with symptomatic treatment only. Another was case group having GBS treated with IVIg. The study was carried out to see the improvement of GBS after specific therapy with IVIg.

In our study, 56% subjects of case group had history of preceding upper respiratory tract infection and 35% had the history of diarrhoea, while in the control group, 60% had respiratory tract infection and 30% had diarrhoea. This finding is consistent with studies by Ho *et al*.[7].

Patients were assessed after 15, 30 and 90 days of treatment with or without intravenous immunoglobulin. Parameters were respiratory function, muscle tone, muscle power, jerks and autonomic function. In all modalities, there was significant improvement in the case group than the control group. This is probably due to blockage of action of antibody to nerve. This study is consistent with the findings by Hughes *et al*.[8] and Hughes *et al*.[9].

There was significant difference in the duration of ICU stay between case and control groups. Up to 7 days of treatment, 9 in the case group and 5 in the control group were in ICU. At 15 days, the number of patients in ICU were 4 in both groups. After 15 days, only one patient stayed in the ICU, but none from case group was in ICU. This signifies that ICU stay also become shorter by giving IVIg. This study correlates with the findings done by Tekgul *et al*.[10].

In our study consisting of 40 patients, 20 in control group and 20 in case group, only one in the case group expired (5%) and cause of death was apiration pneumonia. No fatality was seen in the control group. This may be due to existing comorbid conditgion. It may also be due to severity of disease. This finding is consistent with Sater[10].

Conclusion:

There was significant improvement of Guillain Barré syndrome patients treated with intravenous immunoglobulin in respect to respiratory function, muscle tone, muscle power, jerks and autonomic function. Also ICU stay was shorter.

Intravenous immunoglobulin plays beneficial role in the improvement of case group with respect to control group. Further research is needeed in the treatment of GBS two weeks after onset of the condition.

Limitation of the study

Number of cases was less because of inability of the patients to procure this costly drug. Local pharmaceutical companies could be encouraged to ensure availability of the drug at a cheaper rate.

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Low Serum Magnesium in Preterm Labour

AA BEGUM[a], TR DAS[b]

Summary:

This study was designed to compare serum magnesium level in women with preterm labour and with those who were in term labour.

A case-control study was carried out in the department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka from July 2005 to June 2007, to evaluate serum magnesium level in women with preterm labour (28-36 weeks) and compare them with those who were in term labour (37-40 weeks). The total number of cases was 160, of which 80 were cases and similar number were control.

The study subjects were selected from inpatient department of Obstetrics and Gynaecology, BSMMU and Mother and Child Health Training Institute (MCHTI), Dhaka.

Serum magnesium level was measured by taking 5 ml of blood from women with term (control) and preterm labour (case).

The basic characteristics, like age, parity and socioeconomic status did not show statistically any significant difference between control arid case groups, but showed significant difference only in the body mass index between the two groups. Mean (±SD) BMI in control and case groups were 24.88±1.42 and 23.12±2.36 kg/m^2 respectively.

Mean (±SD) gestational age were 38.95±0.89 and 33.03±1.83 weeks, respectively in control and case groups.

The mean (±SD) serum magnesium levels were 2.02±0.20 (range 1.70-2.4) and 1.65±0.19 (range 1.30-2.00) mg/dl, respectively, in control and case groups. 'The difference was highly significant (p<0.001).

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Introduction:

Preterm labour is defined as labour occurring before 37 completed weeks of gestation.[1] Preterm labour with its complications is the leading cause of perinatal mortality and morbidity and poses a great challenge to modern obstetrics. Incidence of preterm labour varies between 5 and 10 percent, and is related to socioeconomic status, disease pattern, genetic constitution-and geographic locations.[2,3]

Preterm labour is associated with many obstetric, medical and anatomical disorders. But the cause of preterm labour in 50 percent of pregnancies, however, is idiopathic.[4] Some important risk factors are severe hypertensive disorder, premature rupture of membrane (PROM), polyhydramnios, low socioeconomic status, low gynecologic age, renal disease, heart disease and previous cervical injury. Besides various aetiology, it may be due to alteration in basic biochemical functions of the body at cellular level stating emphasis to trace elements, of which magnesium being one of them, is subject of interest nowadays.[5] Normally, basic biochemical functions of the body are maintained by various minerals, water and trace elements. Magnesium, one of the trace elements, is an important cation of the body. It was shown that low magnesium plays a vital role in the premature onset of labour.[6]

Decrease of magnesium plays an important role in the physiology of parturition. Decrease of magnesium in plasma may be responsible for decrease of the same in myometrium, and this might have a considerable influence on preterm labour, thus suggesting the prophylactic administration of magnesium in pregnancy to be useful.[7]

Rising serum magnesium level serves to relax uterine smooth muscles, thereby providing the basis for the use of magnesium sulphate as a tocolytic agent.[8]

Magnesium is inexpensive and well-tolerated when given to patient in preterm labour. Many pregnant women, particularly women of lower socioeconomic status, do not have adequate magnesium in their diet.[6]

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Magnesium and calcium, similar to sodium and potassium, plays an important role in the physiology of contraction of smooth muscle. Magnesium, which antagonizes the action of calcium, is successfully employed in the preventive treatment of preterm labour. Physiology and pathophysiology of magnesium are the subject of current research in obstetrics. Magnesium activates approximately 200 enzymes and affects the nerve conduction and uterine contractility. The decreased serum concentration of total calcium and magnesium in women with threatening of preterm delivery may be related to premature uterine contractility. Possible mechanism by which hypomagnesaemia induces uterine irritability is by inhibition of adenyl-cyclase with resultant increase in cytoplasmic calcium level. Hypomagnesemia may be a marker of preterm labour.[9]

Thirteen percent of all infants are classified as low birth weight (<2.5 kg). Three percent of these are mature low-birth-weight infants and about 10 percent are truly premature. The latter group accounts for nearly two-thirds of infant deaths (approximately 25,000 annually in the United States).[4]

The care of premature (birth weight 1.0-2.5 kg) and immature (birth weight < 1 kg) infants is costly. Compared with term infants, those born prematurely suffer from greatly increased morbidity and mortality (e.g. functional disorders, abnormalities of growth and development). Thus, every effort should be made to prevent or inhibit premature labour.[4]

The aim of this study is to determine the relationship between serum magnesium bevel and preterm delivery, so that the high morbidity and mortality related to prematurity could be reduced by early diagnosis of this deficiency and its correction.

Materials And Methods:

This was a case control study carried out in the department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU) and Maternity and Child Health Training Institute (MCHTI) during the period from July 2005 to June 2007.

Total 160 pregnant women aged 16 to 40 years of whom 80 at term (between 37 and 40 weeks gestation), singleton pregnancy with regular uterine contraction at a frequent interval documented by uterine palpation, generally more than two in 30 minutes with dilatation (at least 2 cm) and effacement of cervix were enrolled in this study. Study subjects were selected from admitted patients, department of Obstetrics and Gynaecology, BSMMU and MCHTI, Azimpur, Dhaka.

Inclusion criteria

Control

a) Pregnant women aged 16-40 years

b) Singleton pregnancy

c) After 37 completed weeks of gestation with labour pain

Case

a) Pregnant women aged 16-40 years

b) Singleton pregnancy

c) Gestation age between 28 and 36 weeks

d) Painful uterine contraction more than two in 30 minutes

e) Dilatation (at least 2 cm) and effacement of cervix

Exclusion criteria

Control

a) Pregnant women having any major disease, such as diabetes, preeclampsia/eclampsia

b) History of taking prior tocolytic agents

c) Placenta praevia

Case

a) Women having any known factor of premature labour like,
   - pregnancy with fibroid uterus
   - pregnancy with known hypoplastic uterus or other uterine abnormalities

b) Prior tocolysis

c) Multiple pregnancy

d) Ruptured membrane

e) Placenta praevia

f) Incompetent cervix

g) Known or detected fetal abnormality

h) Polyhydramnios

Study Procedure

In this study, serum magnesium level of a group of women with term and preterm labour pain was estimated and compared.

Blood was collected from antecubital vein of the control and case groups with disposable syringe with full aseptic precaution. Blood was drawn once from each subject. Collected blood samples were kept in 5 ml screw-capped vials. After collection of blood samples, these were immediately brought to the Department of Biochemistry, BSMMU, where serum was separated by centrifugation (at 3000 rpm, at 20^0C, for 10 minutes). These serum samples were then analyzed for serum magnesium level by special magnesium analysis kit.

Results:

Among 160 study group 80 control 80 case, of them mean (±SD) age in control and case groups, respectively were 26.05±5.13 and 25.68±5.84 years (range 18-37 and 17-36 years). Age did not show any significant difference between the two study groups (Table-I).

Table-II shows significant difference in BMI between control and case group. Mean (±SD) BMI in control group was 24.88±1.42 and in case group was 23.12±2.36 kg/m^2. BMI £ 25 kg/m^2 in control group was seen in 38(47.5%) and in case group in 52(65%) women while BMI >25 kg/m^2 was seen in 42(52.5%) of control and 28(35%) of case group of women.

Table-III shows what serum magnesium level was significantly low in case group of women (mean±SD 1.65±10.19, range 1.30-2.00 mg/dl) compared to control group of women (mean±SD 2.02±0.20, range 1.70-2.40 gm/dl).

Effect of socioeconomic status on serum magnesium level in control group shows significant difference in serum magnesium level between low and middle income groups ($p<0.01$), while in case group, there was no significant difference. In both the groups (control and case), mean serum magnesium level was higher in middle-income group of women compared to low-income group Table-IV.

Table-V shows the effect of BMI (Body Mass Index) on serum magnesium levels in control and case group. In control group, BMI showed significant difference in serum magnesium level between £ 25 kg/m^2 and >25 kg/m^2 groups ($p<0.01$), while in case group, there was no significant difference. In both the groups (control and case), mean serum magnesium level was higher in women with BMI >25 kg/m^2 compared to £ 25 kg/m^2.

Table-I

Age distribution of the study subjects

Age (years)	Control (n=80)		Case (n=80)		p value
	No.	(%)	No.	(%)	
≤25	34	(42.5)	40	(50.0)	> 0.10^{NS}
26-30	34	(42.5)	22	(27.5)	
>30	12	(15.0)	18	(22.5)	
Mean±SD	26.05±5.13		25.681±5.84		> 0.50^{NS}
Range	18-37		17-36		

Chi-square test/Unpaired Student's 't' test

^{NS}=Not significant

Table-II

Body mass index of the study subjects

BMI (kg/m^2)	Control (n=80)		Case (n=80)		p value
	No.	(%)	No.	(%)	
£ 25	38	(47.5)	52	(65.0)	< 0.05*
> 25	42	(52.5)	28	(35.0)	
Mean±SD	24.88±1.42		23.12±2.36		< 0.001***
Range	20.89-27.06		17.31-27.41		

Chi-square test/Unpaired Student's 't' test

^{NS}=Not significant *= Significant

Table-III

Comparison of serum magnesium level

Serum magnesium(mg/dl)	Control (n=80)	Case (n=80)	p value
Mean±SD	2.02±0.20	1.65±0.19	>0.001***
Range	1.70-2.40	1.30-2.00	

Unpaired Student's 't' test
***=Significant

Table-IV

Effect of socioeconomic status on serum magnesium level

Socioeconomic status	Serum magnesium (mg/dl)		p value
	Control	Case	
Low			
Mean±SD	1.92±0.13	1.61±0.17	< 0.001***
Range	1.70-2.20	1.30-1.90	
n	24	32	
Middle			
Mean±SD	2.06±0.21	1.67±0.19	< 0.001***
Range	1.70-2.40	1.40-2.00	
n	56	48	
p value	<0.01**	>0.10NS	

Unpaired Student's 't' test NS=Not significant **/***=Significant

Table-V

Effect of BMI on serum magnesium level

BMI (kg/m^2)	Serum magnesium (mg/dl)		p value
	Control	Case	
≤ 25			
Mean±SD	1.95±0.16	1.62±0.17	< 0.001***
Range	1.70-2.40	1.30-1.90	
n	38	52	
> 25			
Mean±SD	2.08±0.21	1.69±0.21	< 0.001***
Range	1.70-2.40	1.40-2.00	
n	42	28	
p value	<0.01**	>0.10NS	

Unpaired Student's 't' test NS=Not significant **/***=Significant

Discussion:

The cause of preterm labour is still unknown. The role of magnesium is also not clear. Recently, involvement of magnesium in physiological and pathological process of labour has been clearly demonstrated. In the present study, serum magnesium level was estimated in 80 cases of preterm labour and in 80 controls of normal term labour. Serum magnesium level was significantly low in preterm group of women (mean±SD 1.65±0.19, range 1.30-2.00 mg/dl) compared to term group of women

(mean±SD 2.02±0.20, range 1.70-2.40 mg/dl). Hence, hypomagnesaemia may be a risk factor in cases of pregnancy where it may result in preterm labour.

In the present study, no significant difference in age, parity and socioeconomic status between control and case groups was observed. There was significant difference in body mass index (BMI). Though there was a relationship between low socioeconomic status, i.e. poor nutrition with preterm labour, in this study it was found that most of the women from control (70%) and case (60%) groups belonged to middle socioeconomic group. Women from higher socioeconomic class usually do not attend BSMMU hospital and MCHTI. The number of low socioeconomic group of pregnant women was also less in BSMMU hospital.

A study showed low serum magnesium level in preterm labour cases. In their study, serum magnesium level was also found to be low in patients belonging to low socioeconomic status, thus relating the low level of magnesium to diet deficient in magnesium.[10]

In a study the serum magnesium level was found to be significantly lower in preterm "labour patients than in nonpregnant and normal pregnant women. In the same study mean (±SD) serum magnesium level in preterm labour cases was 1.42±0.22 mg/dl. In 15 cases of second trimester preterm labour, mean (±SD) serum magnesium level was found to be 1.55±0.24 mg/dl. The mean (±SD) serum magnesium level was 1.37±0.19 mg/dl in third trimester preterm labour cases. No significant influence of age and parity was found on serum magnesium levels.[6] In present study no significant influence of age and parity was found.

The findings of the present study also demonstrated that serum magnesium concentration was lower in preterm labour, which was 1.65±0.19 (range 1.70-2.40 mg/dl). It was considered serum magnesium level below 1.8 mg/dl as hypomagnesaemia which may lead to preterm labour. It was found that labour was prolonged when magnesium sulphate was used in eclamptic patients.[11] It was demonstrated that magnesium sulphate is effective as primary tocolytic agent with minimal side-effect. The average level of magnesium in nonpregnant healthy women of reproductive age is 2.40.49 mg/dl.[12]

A study reported serum magnesium level ranged in nonpregnant women 1.8-2.8 mg/dl (mean±SD 2.2±0.33 mg/dl), in normal pregnant women 1.5-2.4 mg/dl (mean±SD 1.9±0.3 mg/dl) and in women with preterm labour 0.96-1.80 mg/dl (mean±SD 1.47±0.33 mg/dl). The difference was significant ($p<0.001$) when compared between normal pregnant women and women with preterm labour.[10]

In a study it was found that serum magnesium level in preterm labour was 1.60±0.46 mg/dl.]3 In a study serum magnesium level was 1.67±0.23 mg/dl.[6] In two other studies, the serum magnesium level in preterm labour were 1.64±0.07 mg/dl and 1.63±0.053 mg/dl, respectively.[14,15]

A study in our country found serum magnesium level in preterm labour as 1.77±0.36 mg/dl.[16] In this study, serum magnesium level was found as 1.65±0.19 mg/dl, in preterm labour which was also significantly low.

All the above studies showed that hypomagnesaemia may be a risk factor for preterm labour.

In an epidemiologic study it was demonstrated that prophylactic oral magnesium supplementation to patient at risk for preterm labour was successful in lowering the preterm delivery rate. Prevention of preterm labour by intake of magnesium should be sufficient to maintain serum magnesium level at the range of 2.0-3.5 mg/dl.[17]

In this study, among the women with preterm labour (28-36 weeks of gestation), statistically, significant lower level of serum magnesium was observed. The lower serum magnesium level, therefore, reflected the tendency of preterm labour or initiation of preterm labour. Therefore, a role of magnesium in the pathophysiology of preterm labour is strongly suspected. Whether magnesium levels drops preceding the development of preterm labour is unknown. Hypomagnesaemia, therefore, may be either a causative factor or simply reflect the process involved with the development of uterine irritability in preterm labour.

Conclusion:

From the present study, it may be concluded that:

- Serum magnesium level was significantly low in women having preterm labour
- Serum magnesium level was significantly lower in low BMI (body mass index) group of women
- No significant difference in serum magnesium level with age and parity was observed

It may be concluded that estimation of serum magnesium in pregnancy may prove to be a valuable tool in predicting preterm onset of labour. The results of the present study add to the existing evidence that low serum magnesium level may be a risk factor for preterm labour.

Recommendation:

Further study is needed with large sample size.

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High Resolution Sonography in Diagnosis of Metastatic Cervical Lymph Nodes in Oral Squamous Cell Carcinoma

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Abstract:

Ultrasound is reported superior to clinical palpation for detecting lymph nodes and metastasis. The advantage of ultrasound over other imaging modalities is price, low patient burden, and possibilities for follow up. A cross sectional Study on 29 cases of oral squamous cell carcinoma was done in Department of Oral & Maxillofacial Surgery, Dhaka Dental College & Hospital, Dhaka from January 2006 to December 2007. The sensitivity, specificity, positive predictive value, negative predictive value & Accuracy of Ultrasonographic technique for determining metastatic cervical lymph node were 93.33%, 50%, 66.7%, 87.5% and 72.4% respectively. Considering the finding of the study, Sonographic evaluation can improve the diagnosis of metastatic cervical lymph node in patients with oral squamous cell carcinoma. It is cost effective, non-invasive, less burden to patient, does not create problem of overlapping with mandible and can be done repeatedly to follow up. Therefore, high resolution sonography may be an adjunct tool in diagnosing metastatic nodes in patients with oral squamous cell carcinoma.

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Introduction:

Oral Cancer is used to describe any malignancy arises from oral soft and hard tissues. Approximately 90% of oral cancers are Squamous cell carcinoma (SCC). Globally, oral cancer is one of the ten most common cancers and it is the second major cause of death after heart disease[1]. It is a major health problem in the Indian sub continent[2]. According to the WHO, about 90% of the oral Squamous Cell Carcinoma in South East Asia is attributable to tobacco use in its different forms and in Bangladesh it is the main aetiological factor[3].

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The single most important factor in determining prognosis of Oral Cancer is whether regional nodal metastasis is present. Survival rates decrease by 50% when nodal metastases are present; a contra lateral node reduces survival by an additional 50%. Consequently bilateral nodal involvement reduces survival actually by 75% and extra nodal involvement reduces this by another 50%[4]. Furthermore, the presence of cervical adenopathy has been correlated with an increase in the rate of distant metastasis[5].

Pre-operative assessment of the cervical lymph node status helps in planning suitable surgical management of the neck, wherein the justification to operate the neck is being questioned more often than not, owing to the fact that only about 30% of clinically negative necks are histopathologically positive once operated[6].

Evaluating neck metastasis based on physical examination findings has been the classic method for patients of new tumors in the head and neck. During the clinical evaluation, careful palpation of the neck, with specific attention to number, position, size, shape, consistency, tenderness and mobility of each node, is noted. Attention is particularly directed to nodes that appear fixed to underlying neurovascular structures, visceral organs, or nodes that demonstrate skin infiltration. The description of each becomes an

important part of the medical record, which can be used to assess the response to treatment of progression of the disease.

Unfortunately clinical palpation of the neck demonstrates a large variation of findings among various examinations. Although both inexpensive to perform and repeat, palpation findings are generally accepted as inaccurate. Here sensitivity and specificity are in the range of 60 – 70%, depending on the tumor studied. Because of the knowledge of sensitivity and specificity of palpation, a neck side without palpable metastasis is still at risk of harboring occult metastasis, with the risk determined by the characteristics of the primary tumor. The incidence of false negative (occult) nodes based on physical examination findings varies in the literature from 16-60%[6]. Before the introduction of diagnostic imaging, clinical palpation was shown to be inadequate for detecting cervical lymph node metastasis. Soko et al reported that only 28% of occult cervical metastases were found by clinical palpation. Fischbein et al. have found clinical examination to have only 70% accuracy at best[7].

Several imaging modalities are used in evaluating the status of lymph nodes in oral cavity cancer, ranging from Ultrasound imaging, Contrast Enhanced Computed Tomography (CECT), Magnetic Resonance Imaging (MRI) to 2-Fluoro-2-deoxy-glucose (FDG) Positron Emission Tomography (FDG-PET) and Lymphoscintigraphy. Ultrasound is reported superior to clinical palpation for detecting lymph nodes and metastasis. The advantage of ultrasound over other imaging modalities is price, low patient burden, and possibilities for follow up[8].

Sonograph of Metastatic lymph node disease characteristically find enlargement with a spherical shape. Affected nodes are hypo echoic, with a loss of hilar definition. In cases of extra-nodal spread with infiltrative growth, the nodal margins are poorly defined. Common findings of metastasis from Squamous cell carcinoma are extra-nodal spread and central necrosis together with liquid areas in the lymph nodes. Lymph node metastasis from malignant melanoma and the papillary thyroid carcinoma have a non-echoic appearance that mimic a cystic lesion. Sonography may also be helpful for assessing invasion of the carotid artery and jugular vein. Torabi et al have reported an accuracy of 89 to 92 % for ultrasound imaging in detecting cervical nodal metastasis[9]. However several authors have shown its sensitivity ranging from 69-81% and positive predictive value of 70-83%. Ariji Y et al concluded that ultrasonic criteria of no hilar flow, peripheral parenchymal nodal flow, and transverse to longitudinal ratio of more than 0.65 together constitute a powerful tool for depicting Metastatic lymph nodes in patients with cancer[10].

Though many studies were done in other countries with successful outcome to assess the metastatic cervical lymph nodes in oral cancer patients, in our country no study has so far been done on this regard. The present study hopefully will achieve the goal.

Patients & Methods:

The cross sectional Study on 29 cases of oral squamous cell carcinoma was done in Department of Oral & Maxillofacial Surgery, Dhaka Dental College & Hospital, Dhaka from January 2006 to December 2007

Patients having histologically confirmed Oral Squamous Cell Carcinoma attending at Dhaka Dental College & Hospital were selected for the study. By convenient sampling 29 cases of such Oral Squamous Cell Carcinoma patients were selected & after taking informed written consent they were evaluated clinically and by High Resolution Sonography (HRSG) for neck metastasis. Standard treatment was provided to all patients being included in the study.

Inclusion Criteria:

All patients diagnosed histologically as Squamous Cell Carcinoma in Oral Cavity

(1) Patients of Oral Squamous Cell Carcinoma with or without clinical evidence of Metastatic cervical lymph nodes

Exclusion Criteria:

(1) Patient of Oral Squamous Cell Carcinoma declared as inoperable for the primary tumor

(2) Patient of Oral Squamous Cell Carcinoma declared as inoperable for advanced neck metastasis

(3) Patient of Oral Squamous Cell Carcinoma declared as inoperable for systemic illness

Data Collection Method:

Data were collected through written questionnaire, clinical examination and by investigation (High

Resolution Sonography Machine). Evaluation of cervical lymph node metastasis was done by clinical palpation with a single investigator and Ultrasonogram by using the HRSG machine (High Frequency Probe at 10 MHz with range of 5-12) in a single centre (Ibn Sina Imaging Centre, Dhaka) operated by an experienced single Sonologist. The result of the modality was compared with post operative histopathological examination.

Data Processing and Analysis:
Data were processed and analyzed using computer software SPSS (Statistical Package for Social Science) version 12. The test statistics used to analyze the data were descriptive statistics, Pearson Chi-square test. The data presented on categorical scale were expressed as frequency and corresponding percentage, while the quantitative data were presented as mean and standard deviation (SD) from the mean. Association between two variables was justified using Pearson Chi-square test. For all analyses, level of significance was set at 0.05 and p-value <0.05 was considered significant.

Results:
Figure 1 shows that majority of the study subjects belonged to the age group of 40-49 years (about 34.5%) followed by the age group 60-69 years (about 24.1%). The age of the study subjects who fulfilled the inclusion criteria ranged from 35 – 85 years (Mean age +/- SD=53.48+/-12.45 years)

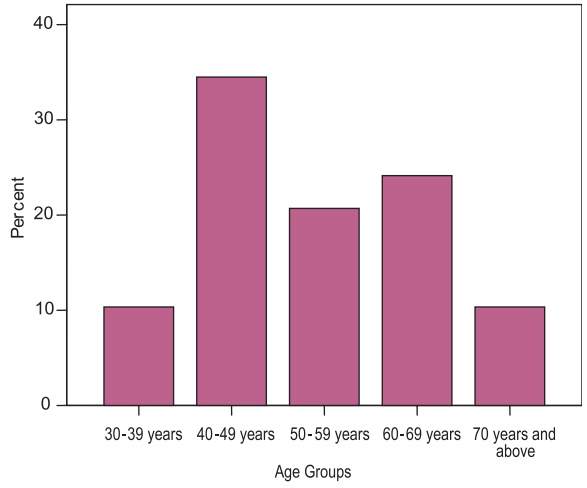

Fig 1: *Age group distribution of study patients (n=29)*

Figure 2 shows that 58.6% of the study subjects were male, while remaining 41.4% of them were female.

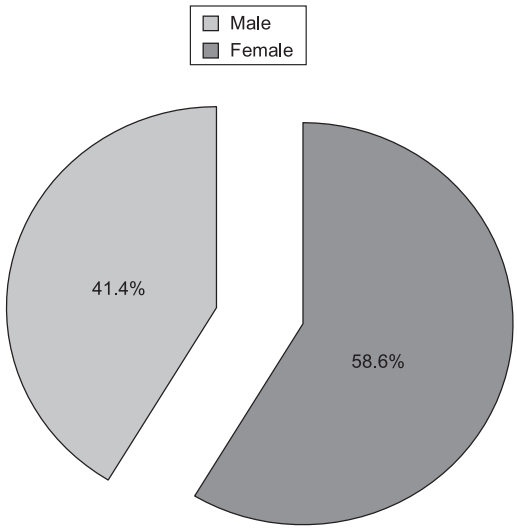

Fig 2: *Sex distribution of study patients (n=29)*

Figure 3 shows that about half (51.7%) of the lesions located in the alveolar ridge. Beside the alveolar ridge the other common sites were Buccal mucosa (27.6%) followed by retro molar area (13.8%). Tongue and floor of the mouth were affected with the same frequency (3.4%).

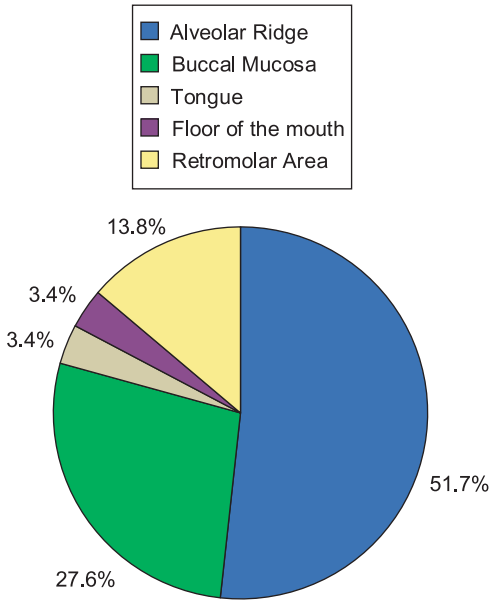

Fig 3: *Site distribution of study patients*

Figure 4 shows that about half of the study subjects (51.7%) were habituated to betel quid chewing followed by 37.9% and 10.3% habituated to smoking and betel quid-smoking respectively.

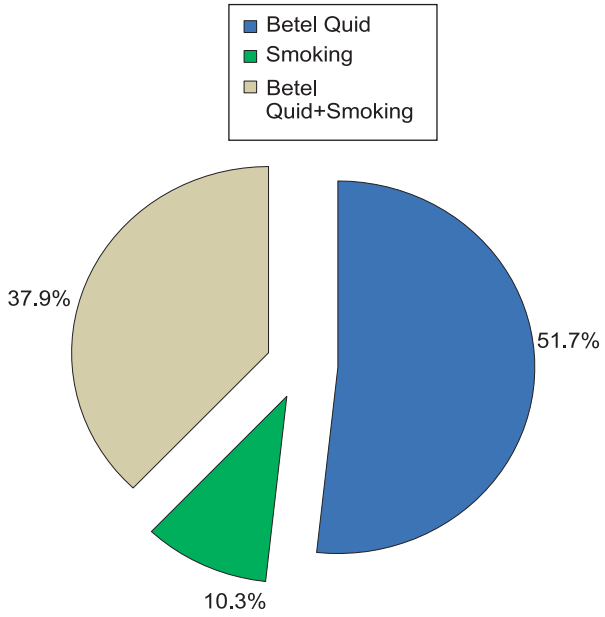

Fig 4: *Distribution of patients by their habits (n=29)*

Figure 5 shows that Grade I lesions was most prevalent in the study subjects (75.9%). 20.7% and 3.4% of the lesions were Grade II and Grade III respectively in the conventional grading system.

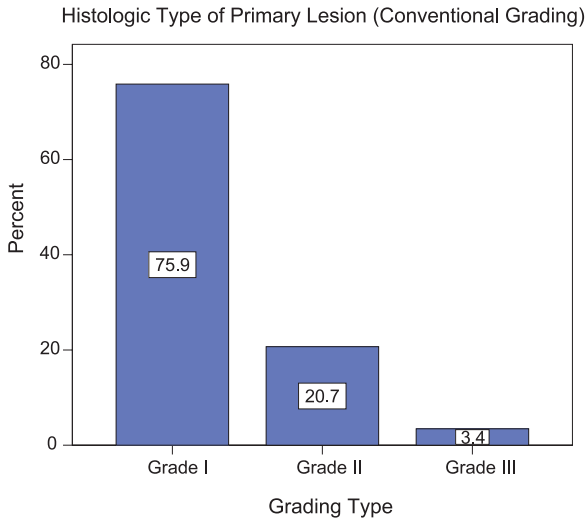

Fig 5:

Figure 6 shows that most of the cases were Stage IV (55.2%) followed by 31% Stage III, 10.3% Stage II and 3.4% Stage I lesion in TNM Staging system.

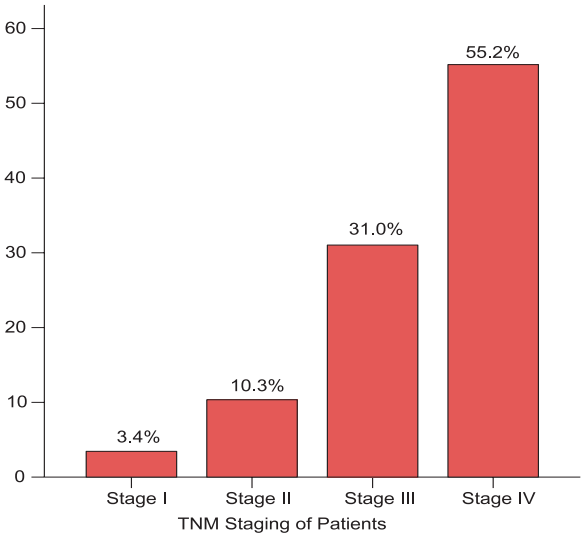

Fig 6: *Distribution of patients by TNM Staging (n=29)*

Table-I

Distribution of study subjects by clinical type & grading of primary lesion (n=29)

Clinical Type of Lesion	Grading			Total
	Grade I	Grade II	Grade III	
Ulcerative	16(76.2%)	4(19.0%)	1(4.8%)	21(100%)
Exophytic	4(66.7%)	2(33.3%)	0(0%)	6 (100%)
Verrucous	2(100%)	0(0%)	0(0%)	2 (100%)
Total	22(75.9%)	6(20.7%)	1(3.4%)	29(100%)

Table 1 shows that most of the ulcerative lesions were Grade-I (76.2%) which is similar to exophytic and verrucous lesions.

Table-II

Association between clinical staging and pathological staging of lymph node

Clinical Staging of Lymph Node	Pathological Staging of Lymph Node			Total
	N_0	N_1	N_2	
N_0	6(100%)	0(0%)	0(0%)	6 (100%)
N_1	6(31.6%)	12(63.2%)	1(6.3%)	19(100%)
N_2	0(0%)	1(25%)	3(75%)	4(100%)
Total	12(41.4%)	13(44.8%)	4(13.8%)	29(100%)

Table 2 shows the cross tabulation between clinical staging of lymph nodes and pathological staging of lymph nodes. Clinically suspected all N_0 neck was confirmed by histological examination. 63.2% of clinically suspected N1 case was confirmed by histological examination where 31.6% become N_0 and 6.3% become N_2.

Table-III

Relationship between Palpation Finding of Lymph Node & Histological Finding of Lymph Node

Palpation Finding of Lymph Node	Histological Finding of LN		Total
	Positive	Negative	
Positive	14(73.7%)	5(26.3%)	19(100%)
Negative	1(10%)	9(90%)	10(100%)
Total	15 (51.7%)	14 (48.3%)	29 (100%)

It was found that sensitivity, specificity, positive predictive value, negative predictive value & accuracy of palpation method for determining metastatic cervical lymph node were 93.33%, 64.29%, 73.68%, 90% & 79.3% respectively.

Table-IV

Relationship between Ultrasonographic Finding of Lymph Node & Histological Finding of Lymph Node

Ultrasonographic Finding of Lymph Node	Histological Finding of LN		Total
	Positive	Negative	Positive
	14(66.7%)	7(33.3%)	21(100%)
Negative	1(12.5%)	7(87.5%)	8(100%)
Total	15 (51.7%)	14 (48.3%)	29 (100%)

The sensitivity, specificity, positive predictive value, negative predictive value & Accuracy of Ultrasonographic technique for determining metastatic cervical lymph node were 93.33%, 50%, 66.7%, 87.5% and 72.4% respectively

Discussion:

The study was performed in Department of Oral & Maxillofacial Surgery, Dhaka Dental College & Hospital from January 2006 to December 2007, where significant number of oral squamous cell carcinoma patients attended regularly. Among them 29 study subjects were selected conveniently who fulfilled the inclusion criteria. The endeavor was initiated with the aim of evaluating the contribution of high resolution sonography to evaluate the metastatic cervical lymph node in oral Squamous cell carcinoma.

According to the study, 58.6% of the total study subjects were male which finding corresponds to other studies on Bangladeshi patients (53% by Sitan[23], 56.5% by Adhikari[24]). The age ranged from 35 to 85 years where majority of the study subjects (34.5%) belonged to the age group of 40-49 years. This data showed similarity with Shaheed[3] et al and corresponds with the information of Sitan [23] 2006 (50-59 years) and Adhikari[24] 2006 (60-69 years) and Langdon[25] et al 1992 (70-79 years).

On clinical examination we found that about half of the lesions (51.7%) were located in the alveolar ridge. Beside the alveolar ridge the other common sites were Buccal mucosa (27.6%) followed by retro molar area (13.8%). Tongue and floor of the mouth were affected with the same frequency (3.4%). This distribution is almost similar to Sitan[23] 2006 but showed disparity with Richard[26] et al and Hsie[27] et al.

Personal habits of the patients were taken into consideration as a risk factor for oral Squamous cell carcinoma. Habit of betel nut chewing was present among 51.7% patients which is almost similar to other investigators[3,23,24,28,29]. The second most common habit was smoking (37.9%) which was followed by both betel quid and smoking (10.3%).

Histopathologically 75.9% of our study specimen were well differentiated, 20.7% moderately differentiated and 3.4% poorly differentiated. This finding is almost similar to Shaheed[3] et al which is 72%, 18% and 6% respectively.

Regional metastasis is one of the most important factors in the prognosis and treatment of patients with head and neck squamous cell cancer[4, 5]. In addition, because lymphatic metastasis is a frequent event that impacts prognosis, a decision to treat the lymph nodes in the neck has to be made in almost all patients, even if metastases are not apparent clinically. It is therefore important to assess as reliably as possible whether a patient has regional lymph node metastases.The

presence of cervical lymph node metastasis in oral squamous cell carcinoma often also changes the extent of surgical treatment or radiotherapy and chemotherapy..

It is well known that palpation is an inaccurate technique to stage cancer in the neck[30]. In a recent decision-analysis study, a risk of occult neck metastases (in a palpatory-negative neck) above 20% was found to be indicative for elective neck treatment, either radiation therapy or surgery. This risk of occult metastasis, which can occur in both sides of the neck, is determined by characteristics of the primary tumor such as size, site, and several biological criteria[11]. Because of the increased risk of nodal metastases, even in clinically negative necks, most patients with tumors staged as T2 or larger undergo some form of elective neck treatment. The disadvantage of this policy is that the majorities of patients do not harbor metastases and, therefore, will be subjected to the morbidity of unnecessary treatment. By detecting some otherwise clinically occult adenopathy, modern imaging techniques may have increased sensitivity for detecting positive nodes, and consequently, may decrease the risk of occult metastasis to below 20%. If this can be accomplished, the clinician may refrain from a neck dissection or radiation, and adapt a wait-and-see policy with careful follow-up to detect a neck metastasis as early as possible[12].

The drawback of palpation method for evaluating neck lymph node is that it is a subjective method and is totally operator and experience dependent. It can be competitive with other investigation modalities if the skill can be improved by repeated examinations of neck. In our study subjects we examined the necks repeatedly for quality evaluation of cervical lymph nodes.

In the study, sensitivity, specificity, positive predictive value, negative predictive value & accuracy of palpation method for determining metastatic cervical lymph node were 93.33%, 64.29%, 73.68%, 90% & 79.3% respectively. This result is comparable to Chowdhury[31] et al where the results are 75.6%, 60%, 88.6%, 37.5% and 72.5% and Haberal[32] et al where the results are 64%, 85%, 78%, 74% and 75%. The comparison proves that positive predictive value and accuracy rates are almost same in all studies though there are some dissimilarity exists in sensitivity, specificity and negative predictive value. It is to be mentioned here that in this study palpation method showed high sensitivity (93.33%) and specificity (64.29%) which have limited clinical value as probably many metastatic lymph nodes were palpable. The sensitivity would have been lower if the study was limited to N_0 neck population.

Imaging techniques like CT, MR, and sonography are more accurate than palpation. Most clinicians have maintained, however, that the accuracy of these techniques is not high enough to justify a change of policy. Indeed, in 25% of pathologically verified tumor-positive neck dissections, only micro metastases smaller than 3 mm, which are undetectable by most techniques, are present [13]. Lymph nodes 2–3 mm in size can be seen as nodules on CT and MR images, and may even be better seen with high-resolution scanners. Nonetheless, differentiation between benign and malignant metastatic disease still remains a problem. Recently, other techniques such as radioimmunoscintigraphy[14] and positron emission tomography[15] have been explored, but these expensive techniques still have to prove their value in clinical practice.

Sonographic criteria, such as nodal size and configuration of the lesion, and Doppler Sonographic criteria have been studied extensively for their value in differentiating between benign and malignant lymphatic disease in the neck. The minimal axial diameter appears to be the most accurate size criterion, compared to the maximal axial diameter and the longitudinal diameter [16, 17]. Regarding the aspect of lymph nodes on sonograms, the echogenic hilus appears to be a reliable parameter[17]. The configuration (shape) of the node might be important, but some authors doubt its value[18]. Following the above criteria our study subjects were evaluated with a high resolution sonography machine with use of color & power Doppler by a more than fifteen years experienced single investigator. After clinical and Sonographic evaluation the subjects were treated by neck dissection. All the detected lymph nodes were evaluated by thorough histopathological examinations by expert histopathologist.

In this study the sensitivity, specificity, positive predictive value, negative predictive value & accuracy of the Sonographic technique for determining metastatic cervical lymph nodes were 93.33%, 50%, 66.7%, 87.5% and 72.4% respectively. The respective values are comparable to other studies e.g. 72%, 96%, 94%, 80% and 85% by Haberal[32] et al, 78% accuracy by Mikami[33]

et al, 94% accuracy by Steinkamp[34] et al, and 92% sensitivity by Naito[35] et al. The analysis proves that the accuracy of Sonographic technique is satisfactory (72.4%) and almost similar to other studies abroad. The important drawback of this technique is that it is operator and skill dependent as like as other investigations.

Sonography-guided fine-needle aspiration cytology (FNAC) has been shown to be very accurate in the evaluation of regional metastatic disease. It combines the high sensitivity of sonography with the excellent specificity of FNAC. The reported sensitivity of sonography-guided FNAC in the N0 neck ranges from 48% to 73%[16, 19, 20], whereas the reported specificity is 100%[21]. In the United States, this technique has received fewer acceptances because it is labor-intensive and operator-dependent. False-negative results may be the result of sampling the wrong node or the wrong part of the correct node. Furthermore, the cytopathologist may overlook small nests or single tumor cells.

Conclusion:

Considering to the finding of the study, Doppler Sonographic evaluation can improve the diagnosis of metastatic cervical lymph node in patients with oral squamous cell carcinoma. It is cost effective, non-invasive, less burden to patient, does not create problem of overlapping with mandible and can be done repeatedly to follow up. Although it has some limitations of operator and skill dependency, it predicts the presence of metastatic nodes with sensitivity equivalent and specificity near to that obtained with palpation method. Furthermore for the detection of nodes in the submental and submandibular regions where other modalities have occasionally been impaired by artifacts from bones and dental amalgam, the doppler Sonographic evaluation facilitates the early detection of metastatic nodes. Therefore, high resolution doppler sonography may be an adjunct tool in diagnosing metastatic nodes in patients with oral squamous cell carcinoma.

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REVIEW ARTICLE

Gamma Knife Radiosurgery: An Overview of Physics, Chemistry, Biology and Neuro-medicine

KMN UDDIN[a], JN ISLAM[b]

Summary:

The gamma knife is a highly specialized treatment unit that provides an advanced sophisticated stereotactic approach to treatment of tumour and vascular malformations within the internal structure of the head. The gamma knife delivers a single high dose of radiation emanating from 201 cobalt-60 unit sources. All 201 beam simultaneously intersect at the same time in a pre-defined location. The treatment planning system for gamma knife radiosurgery has been developed using nonlinear programming techniques. The system optimizes the shot sizes, location and weights for gamma knife treatments. Open stereotactic technique in the 1990's was essential for the treatment of a number of functional conditions and cystic space occupying lesions. It has an important part to play in the investigation of tumours and can help to increase the number which are accessible to treatment. It can be employed to guide not only solid instruments but also ionizing irradiation to "mass-lesion – targets". It is just this combination of stereotactic guidance and narrow beam, high energy radiation to precisely defined target, is the basis of gamma knife radiosurgery . The topic on radiological physics presents a broad field, which includes physics of radiation therapy, diagnosis and nuclear medicine. The emphasis is on the basic physical principles which form a common foundation for these areas. Consequently, the topic provides both basic radiation physics, physical aspects of treatment planning and use of radiation beams. Some knowledge of the effect of ionizing radiation on living tissues is necessary, for those who wish to understand the nature of any treatment using radiation and who also wish to inform patients about such treatment. The topic relates to the effects of radiation on visible structures, in other words, cells and tissues. The radiobiological knowledge described here has been developed in relation to standard radiotherapy. Moreover, the linear quadratic model of cell killing is also applicable for single dose irradiation.

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Introduction

The gamma knife is a very specialized treatment unit that provides an advanced and sophisticated approach to the treatment of tumour vascular malformations, and pain disorder within the head. Multiple beams of radiation are focused into an approximately spherical volume, from inside a shielded treatment unit, generating high dose shot of radiation. The treatment planning process determines where to centre the shot, how long to expose them for and what size focusing helmets should be used, so as to cover the target with sufficient dosage without damaging normal tissues or surrounding sensitive structures. There are two types of radiation treatment planning process: forward planning and inverse planning . In inverse treatment planning, an objective function is defined to measure the goodness (quality) of a treatment plan. Two types of objective functions are often used: dose-based model and radiobiological model. The biological model argues that optimization should be based on the biological effects resulting from the underlying dose distributions. The treatment objective is usually to maximize the tumour control probability (TCP)[21] while maintaining the normal tissue complication probability (NTCP)[21] to within acceptable levels. Unfortunately, these types of objective function are not rigorously described in the literature and hence it is currently not well suited to optimization approaches. The type of objective function throughout the paper is based solely on dose, in which achieving accurate dose distributions are the main concern.A model has been proposed by Michael C. Ferries, [15,15,19] Jim-ho Lim and David M. Shepard [15,15,19] in which there are three types of decision variables:

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1. A set of coordinates (x_s,y_s,z_s): for each shot of the position centres, each coordinate is a continuous variable to be chosen.
2. A discrete set of collimator sizes: currently four different sizes of focusing helmets are available (4 mm, 8mm, 14mm and 18mm); there may be more recent ones.
3. Radiation exposure time: the dose delivered is a linear function of the exposure time; in some suitable sense, one has to determine the optimum time period.

History of Gamma Knife

The principles of gentle sterile surgery based on knowledge of and respect for the body's compensation mechanisms is part of the mainstream tradition of medical development in the twentieth century. As medical men tend to be conservative, it would take a powerful and courageous intellect to break with such a tradition. Lars Leksell, for many years, Professor of Neurosurgery at the Karolinska Hospital in Stockholm possessed such an intellect. He was one of the most creative neurosurgeons of the 20th century. Over a period from the 1940 to the 1980's, he devoted his time to method of treatment, which were not confined to taking advantage of the compensation mechanisms that make open surgery possible. On the contrary, his work seems to have had a central aim to reduce operation trauma to an absolute minimum. In his monograph, Stereotaxis and Radiosurgery, he states:

The tools used by the surgeon must be adapted to the task, and where the human brain is concerned they cannot be too refined.

One of Leksell's first clinical contributions[1] was to device a stereotactic frame for routine use in humans. Prior to this, stereotaxy had been primarily an experimental tool, though a stereotactic technique had been used in the treatment of trigeminal neuralgia and for intracerebral targets. The advantage of the Leksell system[1] was that it was relatively simple and versatile in operation, when compared with other contemporary stereotactic system. As a result sterotactic surgery gained an impetus which has been maintained to the present day. With Leksell's system, access could be gained to any intracranial region with minimal trauma. However, Leksell's attempt to minimize operative trauma did not stop with the design and further development of a clinical stereotactic system (Gamma knife).[1] He went further and with a small group of associates devised an apparatus for treating intracranial pathological process, without opening the cranium. This instrument, the Leksell Gamma knife, was designed for use with the Leksell stereotactic system.

Radiosurgery VS Gamma Knife

The terms radio surgery and Gamma knife have been the source of some controversy. Those who use radio surgical techniques would justify the use of the term as follows. When ionizing radiation is employed to damage or destroy a pathological process, it is vital that normal tissue in the neighbourhood of the lesion remains undamaged. This is achieved in conventional radiotherapy by fractionating the dose and by directing the radiation first from one side and then from the other. The beams are few, broad and seldom more than 8 different beam directions are used; with the gamma knife technique, there are over 200 beams of radiation and they are individually very narrow. This arrangement enables the construction of a very precise radiation field, limited to the pathological lesion. Normal tissue is excluded from dangerous level of irradiation, because in radiosurgery a correlate of the very precise radiation field is a rapid fall in radiation levels just beyond the edge of the lesion. This is due to surgical precision of the radiation field, administered at a single session. That had led to the term radiosurgery. The gamma knife is the first radiosurgery instrument which has gained widespread use in clinical medicine. However, it has no resemblance to any ordinary knife. It is a massive machine, which weighs about eighteen tons. Nonetheless, it delivers an exact field of the radiation. Thus if the technique is called radiosurgery the instrument performing the treatment is by analogy a radiosurgery knife. Since the radiation source is ^{60}Co, which emits gamma radiation, this particular radiosurgery instrument is called Gamma knife.

A Leksell Gamma knife treatment has four basic phases:Attaching the head frame, imaging, treatment planning and the treatment itself.

Treatment Goal:

The plan aims to deliver a high dose of radiation to the intracranial target volume with minimum damage to the surrounding normal tissue.

1. A complete 50% iso-dose line coverage of the target volume. This means that the complete target must be covered by a dose that has intensity at least 50% of the maximum delivered dosage. This can be thought of as a "homogeneity" requirement.
2. To minimize the non-target volume that is covered by a shot or the series of delivered shots. This requirement is clear and can be thought of as a "Conformity" requirement.
3. To limit the amount of dosage that is delivered to certain sensitive structures close to the target. Such requirements can be thought of as "avoidance" requirements.

The number of shots that will be delivered is specified to the optimization tool[22]. While other approaches may try to minimize this number, it is typically straightforward to estimate this number and then develop a plan to optimize other important features for the treatment.

Principles of Stereotaxy

This technique relates to the location of deep and interaccessible intracerebral structures to a three dimensional Cartesian axis system. The first step in this process[7] is to enclose the head in such a system. This is done by fixing a rigid metal frame to the head. The borders of the frame then constitute the Cartesian axes, while the cranium serves as a platform to support the frame and the cerebrum is enclosed both physically and conceptually within a microcosm.

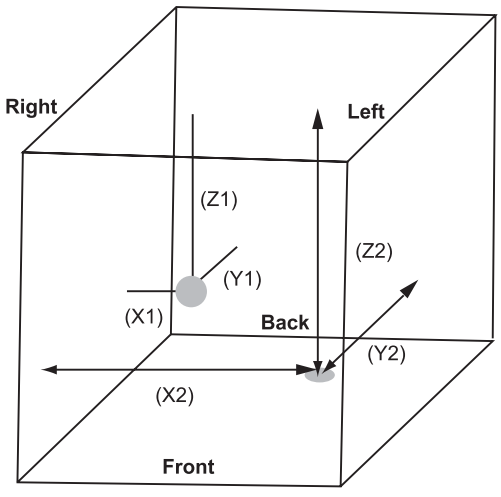

Fig 1: *Stereotactic principle (1)*

Stereotactic technique relates the position of intracranial targets to visible cranial or extracranial markers. The markers used today consist of a frame which is also a Cartesian axis system. The targets are related to the sides of the frame by perpendiculars dropped from the frame to the target. As can be seen, only one point is identified by the values X1,Y1,Z1 just as only one other and quite distinct point is identified by the values X2,Y2,Z2. Thus any intracranial location can easily be identified in relation to the frame which is fixed to the head. The orientation of the frame is a secondary consideration. It is the frame and not the head which is used to localize. This is useful in Gamma knife work where it may be convenient to place the frame eccentrically or to rotate it in respect of the head.

Where every point can be precisely defined in space. The way in which a point within the frame is defined in terms of the three Cartesian axes is depicted in Fig.1. Thus it is possible to define any intracranial target in respect of the frame. However, to be of any use the frame must itself be a platform for a device, which will hold an instrument or electrode, to be introduced into the brain, to reach the target. The small diameter of the instruments used and the mechanical stability with which they are held and introduced, by means of a rigid holder and guide, and the extreme accuracy of the localization implicit in the method are the basis of the exceptionally atraumatic nature of stereotactic procedures.

The Leksell System[1]

A great variety of different stereotactic systems have been designed over the last forty years. Each system has its protagonists and its special fields of application. For a description of the essential technical principles of stereotactic surgery reference will be made to the Leksell system, because it is the system used in Gamma knife surgery. These principles are on the whole independent of the system used, though the way in which technical problems are solved differs from system to system. The sides of the cubic frame constitute the axes of the instrument. An arc is mounted on the instrument in an adjustable holder which is regulated in respect of the desired values in the three axes. The arc may be rotated backwards and forwards, with respect to the frame. The instrument holder is mounted on the arc and may be moved transversely across the whole circumference of the arc. When the axis values for the target point have been determined, the centre of the arc will always

coincide with the target point. The arrangement allows a needle to be pointed as its target from an almost infinite number of directions. Thus, it is simple to design an optimal trajectory for the instrument to be introduced into the depths of the brain, avoiding especially sensitive structures, for example eloquent brain or important blood vessels. An important point of the design is that, for a given target setting, the point of the instrument introduced to the centre of the arc does not move. It does not move irrespective of how the direction of the shaft of the instrument is varied, by moving the arc backwards and forwards or by moving the needle, the holder transversely across the arc. This effect is quite uncanny and is illustrated in Fig 2

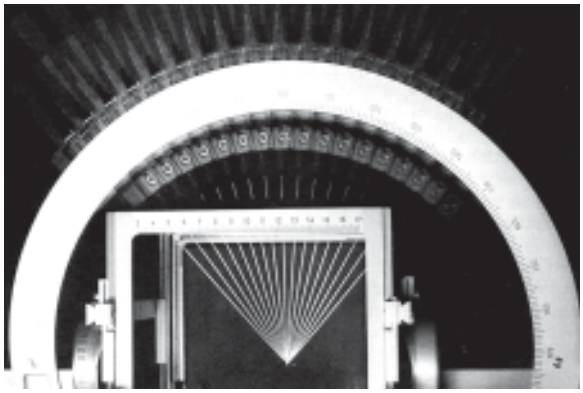

Fig 2: *Stereotactic principle (2)*

This is an illustration of a stereotactic frame, with a needle mounted, as it would be for penetration to a specified intracranial target. The picture is retaken with the needle approaching the target from a variety of directions. As can be clearly seen, the direction of the needle in no way affects the positioning of the point, which is placed at the desired target, as determined by appropriate adjustment of the various axes of the system.

The name of the axes are of course X-axis, Y-axis, and Z-axis. However the direction of the disparate axes varies from stereotactic system to stereotactic system. The choice of which axis points in which direction was originally arbitrary. However, with the Leksell system, as with most others in use today, the convention has become that the X-axis runs from side to side, the Y-axis runs from behind forwards and the Z-axis runs from above downwards.

For anyone who wishes to remember the direction of the axes, the common zero point is above and behind the right ear.

Target identification

The features of a stereotactic system, which have been outlined so far describe how a point in space, a so-called target point may be defined in terms of the reference axes system, built into the stereotactic frame, fixed to the head. If the target is "visible" for example a space occupying lesion, then a general knowledge of cerebral anatomy together with adequate imaging techniques will suffice. However, in the early days, stereotactic technique was almost exclusively used for the treatment of functional disorders. The targets in this situation are "invisible" consisting of discrete nuclei or tracts within larger anatomical entities, such as the thalamus or the basal ganglia. To locate such targets, a map of the region is required or rather a collection of maps in an atlas. An atlas of the internal cerebral anatomy of a variety of laboratory animals has already been produced by Horsley and Clarke in the first decade of the 20th century. The production of a human stereotactic atlas in 1952 was one of the major contributions of the pioneers Spiegel and Wycis, mentioned above.

Newer Localization Methods.

It is interesting, that Leksell's first stereotactic operation on a patient, using his own instrument, was to instill radioactive isotopes, into a craniopharyngioma cyst; the development of computer assisted tomography (CT) and more recently magnetic resonance imaging (MRI) have greatly

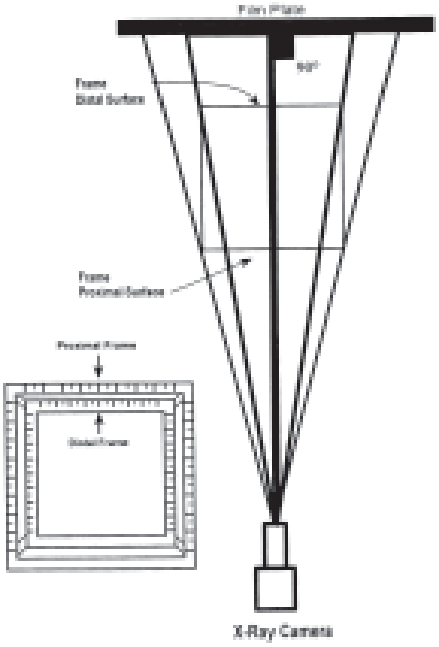

Fig 3: *Angiogram Indicator*

facilitated stereotactic procedures. These techniques render space-occupying lesions truly visible and thus simple to localize. Moreover, the modern machines can incorporate software which will superimpose a stereotactic grid on the film and this makes localization extremely simple.

This use of the stereotactic frame, with CT and MRI units necessitated the development of an adaptor to fix the stereotactic frame to the CT/MRI table, to ensure that the axis system of the frame and the axis system of CT/MRI software were concordant. A word of caution must be mentioned in respect of using MRI for target localization. There is a degree of anatomical distortion in MRI pictures, which increases from the centre to the edges. This distortion must be minimized by repeated checks. It makes central placement of the target within the frame even more important than otherwise; a topic to which we shall return.

Modern Indications for Stereotaxy

Stereotactic technique[1], following the advent of CT imaging has a large number of indications, most of which have been mentioned. There has however been a tendency for its use to be restricted to a relatively small number of enthusiasts. It is not, even today, used routinely by all neurosurgeons. This is partly because, in the majority of centres, it has been used for functional work, which requires a specialized neurophysiological knowledge, that is not a part of all general neurosurgical training programmes. Furthermore, the basis of the technique is not technical surgical virtuosity but rather the avoidance of the need for such virtuosity. The Karolinska Hospital Neurosurgery Department, under Leksell's aegis taught that stereotaxy was not to be considered an alternative to other forms of treatment but to be used in addition to the more traditional armamentarium of neurosurgical options. Any method which reduces the per-operative trauma of a neurosurgical procedure to a minimum must be considered as preferable to one relying on surgical virtuosity, which takes advantage of the brain's compensation mechanisms. There are then three main areas of indication, which have been used for open stereotactic procedures. Firstly, there is the original group of functional illnesses already mentioned. Secondly, there are the direct primary treatments of cystic space occupying lesions, for example the installation of radioactive isotopes into craniopharyngioma cysts and the aspiration of abscesses. Moreover, aspiration of intracerebral haematomas may also be performed stereotactically, though the timing and indications remain a matter for debate. Finally, solid tumours may be biopsied as a preliminary to rational treatment planning.

Combination of target and radiation

Open stereotactic technique[1] in the 1990's was essential for the treatment of a number of functional conditions and cystic space occupying lesions. It has an important part to play in the investigation of tumours and can help to increase the number which are accessible to treatment. It is regrettable that the technique is not, even today, in routine use in all Neurosurgical Departments. This is undoubtedly the result of a misunderstanding of the role of stereotactic technique for a modern Neurosurgical service. It may also be the result of the innate conservatism of those who finance the acquisition of the necessary equipment and of those who would have to use it, once acquired. In the opinion of the researchers, the increase in precision and the reduction of surgical trauma, inherent in the technique makes it very difficult to argue against its widespread, routine application. Nonetheless, it has its limitations. As yet it cannot of itself be used in the effective removal of solid tumours. However, it can be employed to guide not only solid instruments but also ionizing irradiation to mass lesion targets. It is just this combination of stereotactic guidance and narrow beam, high-energy radiation, to a precisely defined target, that is the basis of Gamma knife Radiosurgery.

Dose Distribution Model

In this proposed method the dose distribution[9,18,22] is modeled non-linearly and a smoothing continuous approach used to treat discrete problem choice. The resulting nonlinear programme is not convex and several heuristic approaches are used to improve solution time and quality.

Gamma knife radiosurgery begins (after administering local anesthesia) by fixing a stereotactic coordinate head frame to the patient head using adjustable posts and fixation screws. Steretactic technique relates the position of intracranial target to visible cranial or extracranial markers. This principle fully depends on three dimensional coordinate system, second is the Leksell system(Leksell head frame) ; this is an illustration of a stereotactic frame, with a needle mounted, as it would be for penetration to a specified intracranial target.

We require an algebraic model of the distribution of the dose for use in our optimization formulations. In this model, we let S represent the set of the shots that we will consider, and W represent the possible shot sizes (typically 4mm, 8mm, 14mm and 18mm). The complete dose distribution can be calculated as a sum of contributions from each shot delivered, once the location of the centre of the shot (x_s,y_s,z_s) is known, and the length of time of delivery $t_{s,w}$ is known. In practice this means that for all (i,j,k)

$$\text{Dose}(i,j,k) = \sum_{(s,w)\in S\times W} t_{s,w} D_w(x_s,y_s,z_s,i,j,k)$$

where $D_w(x_s,y_s,z_s,i,j,k)$ is the dose delivered to the voxel (i,j,k) by the shot of width w centered at (x_s,y_s,z_s).

To determine the form of D_w, the following procedure was followed.

$$D(d) = \frac{D(0,0,0,d,0,0) + D(0,0,0,0,d,0) + D(0,0,0,0,0,d)}{3}$$

These values were used as data in a nonlinear parameter estimation problem.

The problem is thus reduced to determining a functional form for the dose delivered at a voxel (i,j,k) from the shot centered at (x_s,y_s,z_s)

We therefore used the following functional form

$$D_w(x_s,y_s,z_s,i,j,k) = \sum_{p=1}^{2} \lambda_p \left(1 - erf\left(\frac{\sqrt{\{(i-x_s)^2 + \mu_p^y (j-y_s)^2 + \mu_p^z (k-z_s)^2\} - \gamma_p}}{\sigma_p}\right)\right)$$

and fit the ten parameters $\lambda_p, \mu_p^y, \mu_p^z, \gamma_p$ and σ_p; p=1,2, to the data described above via least squares, with different values for each shot width. The notation erf(x) represents the integral of the standard normal distribution from – " to x.

The resulting nonlinear optimization problem[3,14,18]

$$\min_{\lambda,\mu,\gamma,\sigma} \left\| \begin{pmatrix} \bar{D}^x(i) - \sum_{p=1}^{2} \lambda_p \left(1 - erf\left(\frac{\sqrt{\{(i-x_s)^2\} - \gamma_p}}{\sigma_p}\right)\right) \\ \bar{D}^y(j) - \sum_{p=1}^{2} \lambda_p \left(1 - erf\left(\frac{\sqrt{\{\mu_p^y (j-y_s)^2\} - \gamma_p}}{\sigma_p}\right)\right) \\ \bar{D}^z(k) - \sum_{p=1}^{2} \lambda_p \left(1 - erf\left(\frac{\sqrt{\{\mu_p^z (k-z_s)^2\} - \gamma_p}}{\sigma_p}\right)\right) \end{pmatrix} \right\|_2$$

was solved using CONOPT. [3,4]

Dose Computation

To ensure the precise localization of the target volume, the Leksell head frame was used. The standard procedure for attaching a stereotactic frame to the patient's head was followed so that the 3D reference points could be seen on computed tomography (CT) and magnetic resonance imaging (MRI) scans. In some cases, this delineation was guided by angiography. After transferring the images to a computer, the cranial surface contours on slice images could be automatically detected. The target volume and critical tissues on these images were determined by a physician-physicist team to ensure reliability or identify any special clinical considerations. Then, based on the external skull contours and target contours, we calculated the different source-skin distances necessary.

To optimize the irradiation parameters, we established a mathematical model, in which dose computation played an important role. We used the same notation as Yan and coworkers[11] used for a gamma knife treatment system; the dose at one point p given by one static gamma ray source can be written as:

$D(d,r,s) = M.OF(s).TMR(d,s).OAR(d,r,s).F^2$,

Where, TMR is the tissue maximum ratio;

OAR is the off axis ratio

F^2 is the inverse correction factor

OF is the output factor

d is the distance of the surface of the scalp and the point of calculation of the central axis along a ray from the source to the shot.

r is the radial distance from the central axis to the point of calculation.

s is the size of the collimator.

M is the converting dose to the source irradiation time.

Nonlinear Optimization

Once a description of the dose is determined, the optimization model[14,18] can be formulated. The basic variables of the optimization we consider include the co-ordinates of the center location of the shot (x_s,y_s,z_s), the width of the shot w, and the time $t_{s,w}$ that each shot is exposed. In practice, we consider a grid G of voxels. There are two types of voxels : T represents the subset of voxels that are within the target and N represents the subset of voxels that are out of the target.

The 50% isodose curve is a curve that encompasses all of the voxels that receive at least 50% of that maximum dose that is delivered to any voxel in the patient. We model such a constraint by imposing strict lower and upper bounds on the dose allowed in the target, namely for all (i, j, k) ºT

$$\theta \leq \text{Dose}(i,j,k) \leq 1$$

In this way, the 100 è % isodose curve is guaranteed to cover the target.

A shot width w is used at location s if ts,w >0 . The main idea is to approximate step function

$$H(t)=\begin{cases} 1 & if \quad .t > 0 \\ 0 & if \quad .t = 0 \end{cases}$$

by a non linear function, $H(t) \approx H\ \alpha(t) := \frac{2\ \arctan(\quad \alpha t)}{\prod}$

For increasing values of , H becomes a closer approximation to the step function H. This process is typically called smoothing. The set of shot widths for a given number of shots 'n' is chosen by imposing the constraint

$$n = \sum_{(s,w)\in\{1,\ldots,n\}\times W} H\alpha(t_s, w)$$

we solve the following problem :

$$\text{Min} \sum_{(i,j,k)\in N} Dose(i,j,k)$$

Subject to

$$\text{Dose (i,j,k,)} = \sum_{(s,w)\in S\times W} t_s, {}_w D_w(x_s, y_s, z_s, i, j, k)$$

$$\theta \leq Dose(i,j,k) \leq 1, \forall (i,j,k) \in T$$

$$n = \sum_{(s,w)\in\{1,\ldots,n\}\times W} H\ (t_s, w)$$

$$t_{s,w} \geq 0$$

note that both problems are highly non convex so there is no guaranty of global optimality

Radio Physics

Basic Concepts

The basic mechanisms, underlying the effect of radiation on matter occur at the atomic and subatomic level. The concept of an atom, consisting of a nucleus containing a specific number of positively charged protons and non-charged neutrons, surrounded by orbits of electrons is familiar. Another important set of concepts in the study of atoms and subatomic particles are embodied in theory; Quantum theory. Quantum theory was developed to explain finding which indicated that electromagnetic radiation sometimes appeared to behave as a wave and sometimes appeared to behave as a stream of particles or quanta, each carrying a certain specific amount of energy, defined by Planck Radiation formula:

$$E=hv$$

where E is energy, h is Planck's constant and v is the frequency of the radiation. Moreover, it is also true that subatomic particles may be considered to have wave like properties. Another important concept, for the understanding of radiations interaction with matter, is that energy and matter are interconvertable, accordingly to Einstein's famous equation:

$$E=mc^2$$

where E is energy, m is the mass of particle being converted into or arising from energy and c is the velocity of light. This dual nature of radiation and subatomic particles is not intuitive and has been considered difficult to understand. However, it is not really so. Many familiar objects have different properties depending on how they are observed. Irrespective of whether waves or particles are considered, an atom can only emit or absorb energy in discrete, discontinuous quanta. The quanta so emitted or absorbed will have a particular energy and by the same token a particular wavelength; in accordance with Planck's equation.

The term ionising radiation refers to radiation which has a sufficiently high energy to be able to dislodge electrons from atoms, or disrupt the bonds between atoms and molecules. Examples of this sort of radiation are ultraviolet ray, X-rays and gamma rays. An atom deprived of an electron will have a net positive charge and thus will have become an ion hence the term ionising radiation.

There are two sorts of radiation source used in radiation treatment, artificially generated irradiation from man-made machines and spontaneously generated radiation from radio-nuclides.

There are two basic kinds of radiation in current use. Electromagnetic radiation has no mass and travels at the velocity of light($c=310^8$ m/s). Particle radiation consisting of for examples protons, neutrons or electrons, has mass and travels at a lesser velocity. Both particles and electromagnetic radiation lose energy to matter by interacting with it. If a radiation passes through matter without striking an atom no ionisation will occur.

Electromagnetic Radiation.

There is of course a vast range of electromagnetic radiation from the lowest frequency radio waves (frequency 10 kHz, wavelength 30 kilometers) up to cosmic rays (frequency 10^{24} KHz, wavelength 1/1000 millionth of an Angstrom unit). In low frequency, long wavelength radiation the wave-like properties dominate. In high frequency, short wavelength radiation, the particle-like properties dominate. For the present purpose, the range of interest is X-rays (approximate 10^{15} to 10^{21} Hz.) and gamma rays (approximate, 10^{18} to 10^{24} Hz).

Fig. 4 *Radioactive Decay*

There are three main types of radioactive breakdown, producing three main products as illustrated here. However, not all radioactive breakdowns produce all products. Thus alpha particles are mostly produced by isotopes of high atomic weight, for example Uranium. Cobalt-60 produces gamma waves, but also loses electrons.

As electromagnetic radiation, gamma rays are produced in a different way (Fig 4) when the nucleus of an atom is in an excited state it can decay to a stable state by emission of one or more photons, (quanta a electromagnetic energy) called in this case gamma rays or gamma photons. The other products of radioactive breakdown are alpha particles (helium nuclei with 2 protons and 2 neutrons) and beta particles (electron) and neutrons. Alpha particles produced by radioactive transformation have too low a penetration to be of much use in clinical practice. Beta radiation also has a low penetration but it may be used following implantation of isotopes in tissue. One example, in the field of neurosurgery is the highly successful treatment of craniopharyngioma cysts with instillation of radioactive yttrium, which emits pure beta radiation. This is not unusual. Many nuclides emit a greater proportion of one of the products of radioactive breakdown than of the others. Thus Uranium-235 is primarily an alpha emitter, just as coblt-60 is mainly a gamma emitter but also emits beta particles.

Particle Radiation.

Electrons and protons are the most commonly used particles in current therapeutic use. An adapted linear accelerator or a betatron, a special sort of accelerator can produce electron beams. Commonest energies of electron beams are 7 to 18 MeV, for the linear accelerator and 12.4 to 124 MeV for a betatron.

Proton particles are produced in particle accelerators, such as the synchrocyclotron. Particle beams have special characteristics, enabling the delivery of a sharply defined dose deep in the tissues, with relative sparing of the tissues on the way in to the high dose volume. The energies of those current use ranges from 72 to 100 MeV.

The Effect of Electromagnetic Radiation on Matter

Ionisation is a chemical as well as physical change. Electromagnetic radiations can react with matter in a variety of ways; for example reflection, refraction interference, that is different forms of scattering. They can induce chemical change only by absorption. When ionising radiation is absorbed it interacts with atoms to detach electrons from their orbits. The energy of these electrons is part of the energy of the incoming photons. There are three main ways in which such interactions between radiation and matter occur, depending on the energy of the radiation. Finally, it should be repeated that some radiation will go through whatever matter is being irradiated without interacting with it.

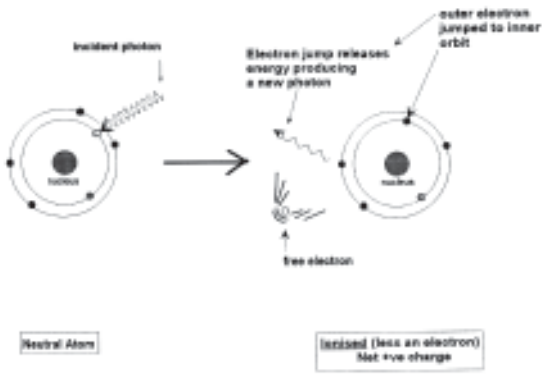

Fig. 5 *Photoelectric Effect*

The photoelectric effect was discovered following the observation that when a spark appears at a gap between two electrodes its appearance could be facilitated by shining light at the gap. The spark was due to electrons crossing the gap. The photoelectric effect is due to the incoming photon from the light loosening an electron and thus facilitating the generation of a spark. The electron released is from the inner shell. The energy of the ongoing photon is discharged when an electron jumps from an outer to the inner electron shell. The energy of this photon is equal to the energy of the incoming photon less the energy imparted to the free electron. Note that the frequency of the incoming photon is less than that of the ongoing photon. This reflects the relationship between the energy and frequency of a photon.

The nuclei of atoms can only be affected by gamma radiation, not by ultra-violet radiation or X-rays; only gamma rays have enough energy to penetrate a nucleus.

The Photo Electric Effect.

This is the major energy absorption mechanism for low energy X-ray beams up to 50 keV, though it also occurs at higher energy levels. All the energy of a given photon is absorbed in detaching an electron from one of the inmost shells of an atom. An outer electron will then hop into the insufficiently filled inner shell, resulting in a change in energy level and the emission of a photon. of X-rays (fig5). The kinetic energy of the originally ejected inner electron will be equal to the energy of the incident photon minus the energy required to detach it from its orbit.

Compton Scattering

With higher energy X-ray beams and gamma rays, with an energy between approximately 90 kev and 5 MeV, a different effect occurs; involving the interaction of the radiation photon with electrons in the outer shell of the atom. Some of the photon's energy will be dissipated in detaching the electron from its path and in giving it kinetic energy. The rest of the energy will continue as a new photon with an energy equal to the energy of the incident photon less the energy required to detech the electron and the kinetic energy delivered to that electron (fig 6). This new photon with a lower energy will naturally have a longer wave length. Quantitative analysis of the effects of radiation in water has shown that the vast majority of the energy absorbed is related to the detached electrons and not to the ongoing lower energy photons.

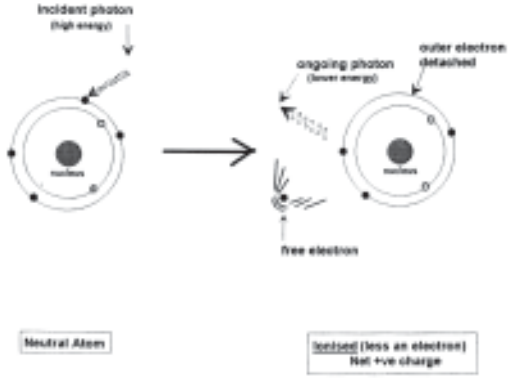

Fig. 6 *Compton Scattering*

Compton found that when X-rays are dispersed in a crystal, there was a change in the frequency of the X-rays, indicating a loss of energy. At the same time an outer electron is freed. The lower frequency of the ongoing X-rays is equal to the energy of the incoming X-ray photons less the energy imparted to the ongoing electron. Note that, as in the photoelectric effect, there is a net gain of one positive charge, and the atom is ionized. This time the energy liberated comes directly from the incoming photon. It is not mediated by means of an electron hopping from one orbit to another. It is the most likely process to be responsible for ionization during Gamma Knife surgery.

Pair Production.

When a photon passes close to the nucleus of an atom it is exposed to the powerful energy field around that nucleus and may thus be converted from a photon of energy into matter , in the form of a pair of electrons (or electron-positron pair). Since the mass of an electron is equivalent to 0.511 MeV the energy of the incident photon must be at least 0.511x2 or 1.022 MeV. One of the pair of electrons has a positive charge(positron) and the other a negative charge(electron). Both these

electrons pass through the absorbing matter exciting and ionising atoms (fig 7).

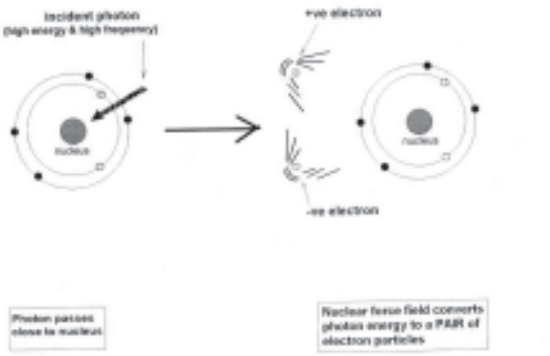

Fig. 7 *Pair Production*

In this case, the incoming photon has a sufficiently high energy to reach close to the nucleus. Here it is affected by the powerful field and is converted into energy. Two electrons are formed in accordance with the law of conservation of electric charge. Thus the minimum number of electrons that can be formed in this way is one with a positive and one with a negative charge. In this way electric neutrality is maintained, the law is obeyed.

The different mechanisms of energy absorption are not mutually exclusive: though the coexiestense of the photoelectric effect and pair production is not thought to occur. However, the radiation energy range, associated with compton scattering occurring at its lower end is associated with the photoelectric effects, while at its upper range it will be associated with pair production.

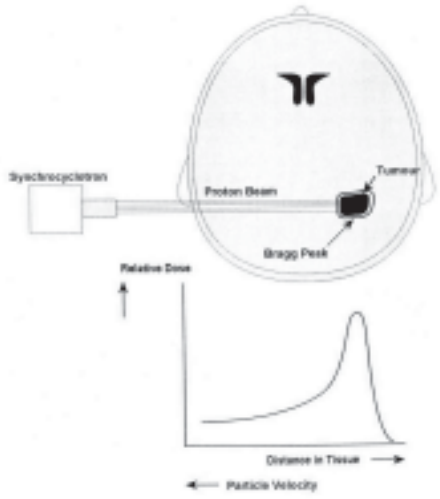

Fig 8 Focal Radiation (Bragg Peak) Most radiation energy delivered from particle radiation is lost when the particles decelerate. This deceleration of particles enables the concentration of the radiation dose over a tightly controlled sharply defined volume, called the Bragg Peak. This is one of the best known techniques for delivering focused radiation today. For the sake of presenting the picture of the radiation and the graph of particle deceleration concordantly; the source in this diagram is placed on the opposite side from the lesion.

The Effects of Charged Particles on Matter.

A crucial difference in the pattern of energy absorption between particles and electromagnetic radiation is related to this characteristic of particles: that they can decelerate while radiations are bound to travel at the speed of light.

The absorption of energy associated with the passage of particles through matter is described by the Linear Energy Transfer(LET), described by the formula -dE/dx where dE is energy loss and dx is unit distance travelled. The units of LET are KeV/mu : where 1mu= 10^{-6}m. The energy loss of particle is reflected by ionisations along the course of its passage. How far the particles will travel in a medium- such as a living tissue- is a function of the density of the medium and its atomic weight on the one hand , and the mass and the velocity of the particle on the other. Protons as an example of "charged heavy particles", with their greater mass can penetrate more deeply.

There is relatively little energy loss along the track of a proton beam, so long as the particle is moving quickly. Thus, such heavy particles have a low LET in the part of their tracks where they are moving fast. However, more and more of their energy is absorbed as they decelerate, so that this part of the track has a high LET. Since most energy absorption occurs at the distal end of the track, most of the ionisations also occur in this region. A consequence of this phenomenon is that particles like protons, with an appropriate delivery system can be used to produce very precisely defined radiation fields at specific distances from the particle source. The precisely defined area of intense irradiation at the end of a low LET track following the passage of protons, is called a "Bragg Peak". However, taking advantage of the Bragg Peak phenomenon is not the only way in which a proton beam may be used to produce a well localized volume of high radiation energy delivery. Cross firing of a number of narrow proton beams will also produce a region of high dose where the beams cross, while the amount of dose delivered along the beam outside the cross firing region will be

low because of proton radiation's low LET. To avoid the development of a Bragg Peak a proton source is used with a high energy and therefore a high penetration, so that the deceleration of protons, necessary for a Bragg Peak will occur after the protons have passed through the living tissue and emerged on the far side (Fig,6.5). Obtaining a sharply defined radiation dose, by using cross firing of a number of narrow radiation beams is central principle of Gamma knife radiosurgery.

Radio Physics and The Gamma Knife

Gamma radiation is of course non-particulate electromagnetic radiation, to be considered either as waves or photons. The gamma radiation produced by ^{60}Co has two energies, reflecting two distinct radioactive breakdown path ways. The gamma radiation from these two reaction series has an energy of either 1.17 or 1.33 MeV depending on which radioactive breakdown pathway is being considered. With radiation energy within this range, according to the description on earlier, most of the interaction between radiation and irradiated tissue can be expected to be mediated by compton scattering and to a lesser degree pair production. The energy level of this radiation is sufficient to give it a high power of penetration. It has a low linear energy transfer (LET). The narrow beams, essential to the technique, are produced by a construction which forces the radiation through collimators in the form of small metal tubes, mounted in the machine's helmet. The size of the collimators is defined in terms of the diameter of the 50% isodose around the centre of the target. These collimator sizes are 4 mm, 8mm, 14mm and 18mm.

Radiochemistry

Early Effects

Radiophysics describes direct effect of radiation, which take place within fraction of microsecond. A common feature of all forms of radiation is the production of free electrons at speed through absorbent medium. These can combine with ions of the same sort and also combine with atoms of other molecules, producing energized unstable products. This is the basis of the indirect effect. In living tissues, among the available molecules which can thus react with electrons is the water molecule, which is present in abundance. In a matter of microseconds free radicals can form according to , for example ,the following equations .

$H_2O \; H_2O^+ + e^-_{aq}$

$H_2O^+ \; H^+ + OH$

$H_2O^+ + e^- \; H^+ + OH^-$

Radiation Injuries of Nucleic Acid Molecules

Chemical bonds may be broken, polymers may depolymerize or new unphysiological polymerization may occur. These processes may be reversible and be subsequently repaired, but they may be permanent leading to biochemical injury. The biochemical changes occur over seconds to hours following irradiation. It is generally thought that the most important target for biochemical injury is the hereditary molecule DNA. There are three main lines of evidence. Firstly, selective irradiation of nuclei and cytoplasm separately has shown that the nucleus is far more susceptible. Secondly, cell death is more easily achieved, when binding radioactive nuclides to different intracellular macromolecules, if the said nuclides are incorporated into the DNA. Finally, there is a strong correlation between the radiation responsiveness of a cell and its DNA content. Thus DNA molecules tend to be fragile. There are four major sort of DNA injuries which are considered to be the most common cause of radiation. These are base damage, cross links with nuclear protein, single DNA strand breaks-SSB –or double DNA strand breaks –DSB (Fig.9). The evidence suggests that it is those DSB, which do not repair after several hours, which are responsible for the sterilization of the cell. It would seem that 1 Gy of radiation produces about 2000 initial single strand breaks and about 40 Double strand breaks. However, the lesion that counts is the DSB which is not repaired.

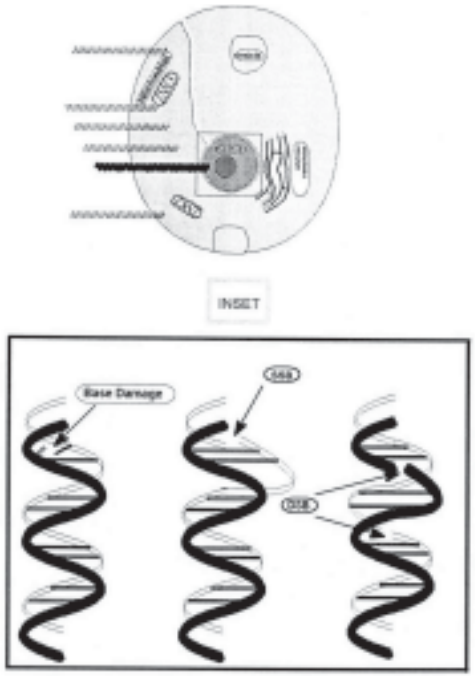

Fig.9. *Cellular Radiation Targets*

Radiation can strike anywhere in a cell, but nuclear DNA is seen as the most important target, as indicated here by the thicker radiation penetrating the nucleus. The inset shows 3 of the common forms of DNA damage. About 2000 single strand breaks (SSBs) occur for 1 Gy, which at the same time produces about 40 double strand breaks (DSBs). It is DSBs which are the lethal lesion. But 1 Gy is also considered to produce an average of 1 lethal lesion per cell, indicating the efficiency of the repair processes.

Biological Changes.

Ionising radiation can damage living tissue, physically and chemically, at the subatomic and molecular level. These chemical and physical changes will be expressed biologically in two main ways. The membranes, enzymes and protein factory of the affected cells may cease to function or function in a deranged fashion. The reproductive functions of the cell may be damaged with destruction or damage to chromosomes, delay in mitosis, mutation and change in the cell cycle. Reflecting the possibility for repair at the physical and chemical levels, these biological changes may recover or they may not. Finally, if the above changes are not lethal in the short term, over a time scale of month to years late effects may be seen in the form of premature aging, carcinogenesis or growth disturbances in the young.

Radiobiology

Cell Survival Studies.

Cell death is the loss of the capacity for indefinite proliferation. Cell survival[1] studies consists in saving the cells from death after the effect of radiation; which is in vitro, in other words. The proportion of surviving cells is called survival fraction and is a much used quantitative indicator of the effect of the radiation. The type of statistics used in calculating the chance of cell kill are called Poisson Statistics. It is estimated that 1 Gy of radiation will give rise to10^5 ionisation per cell. On the other hand this amount of radiation produces only about 40 double strand breaks in the cell's DNA. Using poisson statistic it is calculated that the percentage of cells which survive, when a radiation dose, sufficient to produce an average on lethal lesion per cell is delivered, is e^{-1} or 37%. This is called the survival fraction. The dose producing a survival fraction of e^{-1} is called D_o.

The relationship between the survival fraction and the dose can be expressed as an equation.

The linear quadratic equation has the form

$p = e^{-(D2)}$ where p is the survival fraction, alpa and beta are constants, linear and quadratic components of the equation.

There are two main conceptual models which, it is postulated may explain the form of the equation. The first is called the Lethal-Potentially-Lethal model (Fig 10).. The second model is called the Saturation Repair Model (Fig 11).

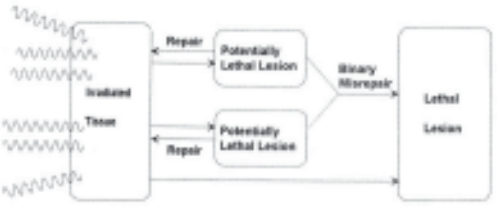

Fig.10 *Lethal-Potentially-Lethal model.*

Fig. 10 A biological model, consistent with a linear quadratic relationship between radiation dose and cell death, is necessary if the said relationship can give any value. One such model is the Lethal-Potential Lethal model. This concentrates on the lesion production and the interaction of lesions. In themselves insufficient to be lethal. The immediately lethal part of the model could relate to the linear part of the curve while the interaction of potentially lethal lesions could relate to the quadratic part of the curve.

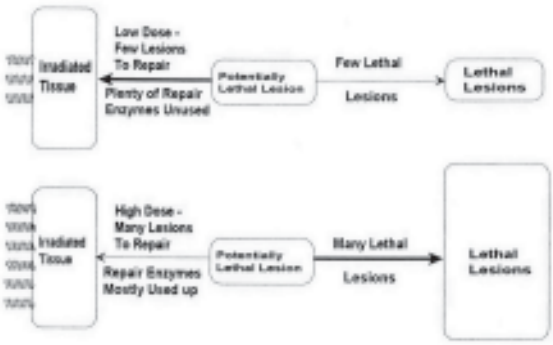

Fig. 11. *Repair Saturation Model of Cell Killing.*

It is also consistant with a linear quadratic relationship between radiation dose and cell death. This concentrates entirely on the accumulating effect of increasing radiation dose on the enzymes responsible for repairing the damage done by radiation. In the upper part of this diagram the dose is low while in the lower part it is higher, indicating a gradual failure of repair capacity. Thus direct hits producing immediate lesions could account for the linear part of curve. The quadratic part of the curve could reflect the increasing failure of overloaded repair enzymes with increasing radiation dose.

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Pheochromocytoma – An Unusual Presentation – A Case Report

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Summary:

This case report is of a 50yrs old man who got admitted in BIRDEM Hospital in a state of unconsciousness for 5 hours .He is a known case of hypertension and diabetes mellitus for the last 12 years and was on insulin. Hypoglycemia was detected, treated with intravenous glucose and the patient regained consciousness. On further query he complained of repeated episodes of nausea, palpitation and sweating for the last 12 years. The episodes were initially labeled as hypoglycemia but blood sugar was never found in hypoglycemic range. The patient was on multiple antihypertensive medications but blood pressure was uncontrolled. All the investigations were normal including 24hrs urinary VMA, serum adrenalin and noradrenalin except ultrasonography of whole abdomen which showed a mass measuring 72x 76 mm in left suprarenal region. One night the patient again developed palpitation, chest discomfort, severe headache and profuse sweating. Blood pressure was recorded 240/160 mmHg. Blood sample was drawn for adrenalin, noradrenalin, 24hrs urine collection was done for VMA and was found very high. The patient was diagnosed as having left adrenal pheochromocytoma. After controlling blood pressure and other preoperative preparations left adrenalectomy was done. Histopathology revealed phaeochromocytoma. Per and postoperative periods were quite eventful. Blood pressure was normal without any antihypertensive drug during discharge. The patient was discharged with the advice to come for follow up after 1 month.

(J Bangladesh Coll Phys Surg 2010; 28: 113-116)

Introduction

Pheochromocytomas are adrenomedullary catecholamine secreting tumors and extra adrenal catecholamine secreting tumors are called paragangliomas.[1]The frequency of diagnosis is 2 patients per million people yearly in the western world, accounting for <1% cause of hypertension.[2] There is no epidemiological data of pheochromocytoma in Bangladesh. Sustained or episodic hypertension in these cases is often resistant to conventional therapy.[1] Triad of symptoms in pheochromocytoma includes palpitation, headache and sweating.[3] Complications are left ventricular failure, dysrhythmias, pulmonary oedema, carbohydrate intolerance, cerebrovascular accident and hypertensive enncephalopathy.[1] Pheochromocytoma is called 10% tumor because 10% are malignant 10% are bilateral 10% are familial and recurrence rate is 10% .[1] Screening should be done in the following situations a) young patients with hypertension, b) patients with paroxysmal symptoms, 3) patients with family history of MEN, VHL, neurofibromatosis, 4) patients developing hypertensive crisis during general anesthesia or surgery 5) patients with unexplained heart failure.[1] We must have a high degree of suspicion for diagnosis of pheochromocytoma. Blood and urine samples should be taken during or immediately after the paroxysm.[3] Twenty-four hours urinary free catecholamines are more sensitive than urinary metanephrins and VMA.[1] Imaging should be done to localize the tumor. Dynamic tests are not popular.[1] Surgery is the treatment of choice .[3] Meticulous pre, per and postoperative measures are essential for better outcome.[3] Mortality from elective

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surgery is 2%. [2] Lifelong follow-up is needed in these cases.[2]

Case report

Mr. M A a 50years old businessman hailing from laxmipur sadar got admitted in BIRDEM on December 18, 2006 with the history of unconsciousness for 5 hours. According to the statement of his wife he is a known case of diabetes mellitus and hypertension for the last12 years. He was on insulin, missed the breakfast on the day of incidence and became unconscious. He was brought to BIRDEM; hypoglycemia was detected, treated with intravenous glucose and the patient regained consciousness. On further query he also complained of repeated episodes of nausea, palpitation, sweating and chest discomfort for the last 12 years. But the episodes were not associated with unconsciousness. Each episode lasted for about half an hour; there was no precipitating factor and the symptoms were relieved spontaneously. The episodes were initially labeled as hypoglycemia but blood sugar was never found in hypoglycemic range. The patient's father was diabetic and none of his other first-degree relatives suffered from any other known endocrine disorder. The patient was on premixed insulin

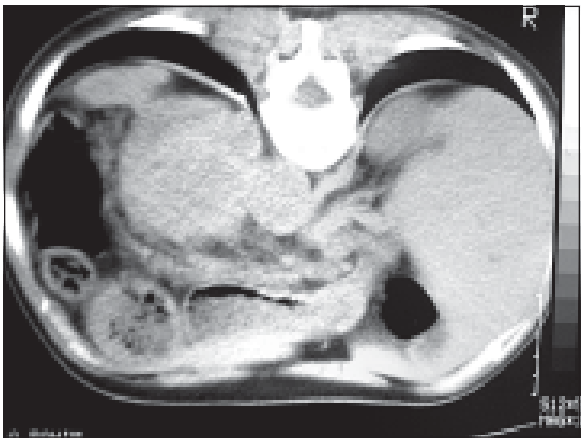

Fig.-1: *CT scan of abdomen shows left adrenal mass.*

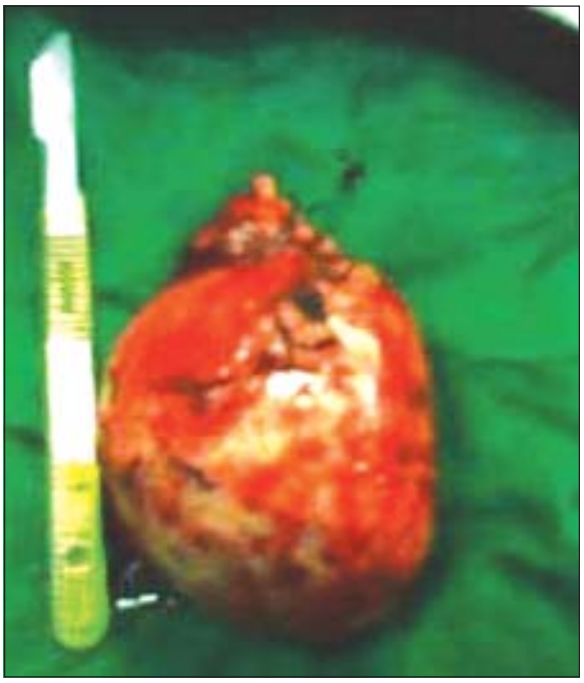

Fig.-2: *Resected left adrenal mass.*

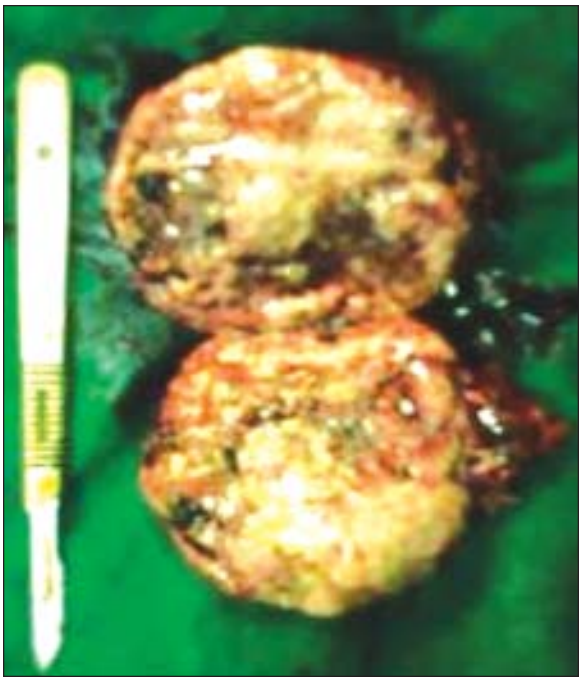

Fig.-3: *Bisected left adrenal mass.*

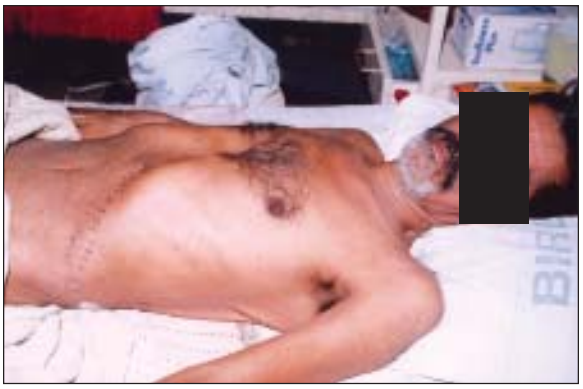

Fig.-4: *Mr. MA after left adrenalectomy.*

and tablet amlodipin, atenolol and lisinopril. The patient appeared anxious; pulse was 110 beats / min. blood pressure 180/100 mmHg. Other physical findings were normal. Our provisional diagnosis was diabetes mellitus, hypoglycemia, and hypertension secondary to pheochromocytoma. The deferential diagnoses for hypertension and the paroxysms were essential hypertension, panic attacks, repeated hypoglycemia, and thyrotoxicosis. Investigation on18/12/2006 revealed no abnormality except HbA1c 7.3%. ECG showed sinus tachycardia, thyroid functions and serum electrolytes

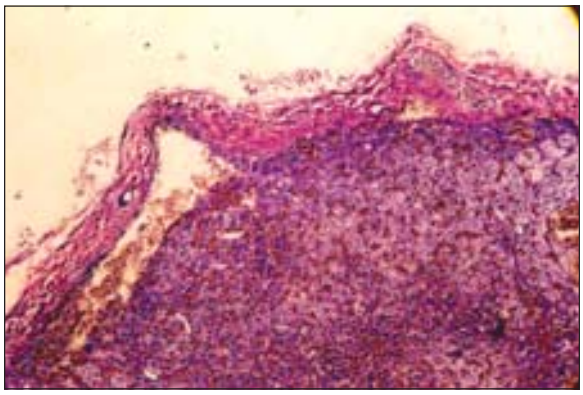

Fig.-5: *Low power microscopic view shows pheochromocytoma.*

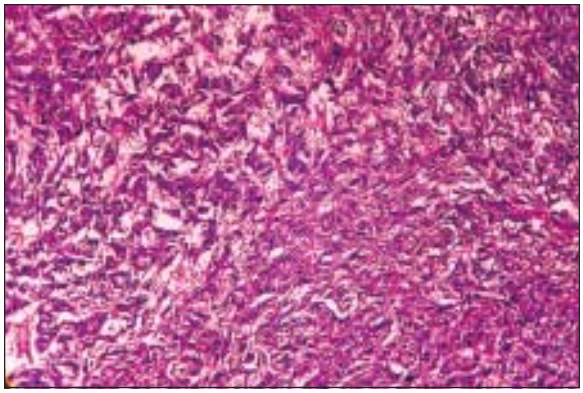

Fig.-6: *High power microscopic view shows pheochromocytoma.*

were normal. On 22/12/06 24Hrs urinary VMA was12.89 mg/day (normal up to 15mg/day), serum adrenalin was 93pg/ml (normal up to 125pg/ml, serum noradrenalin was 285pg/ml (normal up to 600pg/ml), basal, 5 pm cotisol and low dose dexamethasone suppression test were normal. Ultrasonogram of the whole abdomen on 24/12/06 showed a rounded mixed echogenic area measuring about 72 x 76 mm in left suprarenal region. On 02/01/06 at 1.00 am the patient again developed palpitation, chest discomfort, profuse sweating, severe headache and restlessness. His blood pressure at that time was 240/160mmHg and he was managed with intravenous GTN. Blood was drawn for sugar, serum adrenalin, noradrenalin and 24Hrs urine collection started for VMA measurement. Blood sugar level was 7.8 mmol/l but this time 24Hrs urinary VMA was 46.4mg/day(normal up to 15mg/day), serum adrenalin was 620pg/ml(normal up to 125pg/ml, serum noradrenalin was 3260 pg/ml(normal up to 600pg/ml).CT scan of abdomen showed a rounded mixed density mass measuring 78x75 mm in left suprarenal region. Final diagnosis of left adrenal phochromocytoma was reached. After controlling blood pressure with prazosin and carvedilol, surgical consultation was taken and finally on 14/1/06 left sided adrenalectomy was done. During induction of anesthesia and manipulation of the tumor blood pressure was raised upto 240/140mm Hg which reduced to 60/30 mmHg after clamping the adrenal vessels. In the peroperative period hypertension was controlled with intravenous esmolol and GTN; hypotension was managed with intravenous dopamine and adrenaline. On the 1st postoperative day the patient suddenly lost his consciousness and was transferred to ICU. At that time blood sugar was normal , blood pressure was unrecordable. ECG was normal and there was no focal neurological deficit. The patient was put on ventilator .CT scan of head and serum cortisol was normal. Intravenous dopamine was started. The patient recovered after 4 days. Histopathology revealed left adrenal pheochromocytoma. After 7 days he was discharged with normal blood pressure without any antihypertensive drug. He was advised to come for follow up after 1 month.

Discussion:

Pheochromocytomas are rare tumors and rare cause of hypertension.[3] The frequency of diagnosis is 2 patients per million people yearly in the western world.[2] But the reported incidence in a mayo clinic autopsy series varied from about 250 to 1300 cases per million. Considering this autopsy data it is clear that the great majority of pheochromocytoma cases are not diagnosed during life. This is due to protean manifestation of the disease.[2] In this case the patient was experiencing repeated bouts of

typical symptoms of pheochromocytoma for the last12 years but the diagnosis was delayed. Clearly we must become more vigilant for pheochromocytoma and employ appropriate screening tests for all patients in whom pheochromocytoma enters into in deferential diagnosis. Common factors precipitating a crisis are straining, exercise, pressure on abdomen, surgery, anesthesia and unopposed b blockade .[1] In our case there was no precipitating factor except the preoperative procedures. Catecholamines have short half-lives and are secreted episodically .A random plasma measurement may miss peak catecholamine levels. On the other hand plasma levels are particularly helpful when samples are collected during a paroxysm.[3] We prepared the patient with sequential a and b blockade, volume expansion with intravenous normal saline and high sodium diet but we could not prevent the post operative shock. It seems that we should have adopted other recommended measures like preoperative autologous blood transfusion, ICU transfer one day before surgery with intravenous, arterial and swan Gang catheters.[4]Followup is life long. Blood pressure should be measured weakly in the 1st year and monthly thereafter.[2] Querterly 24Hrs urine collection for catecholamines during 1st year then annually or semiannually for at least 5 yrs. Five years survival rate for pheochromocytoma in benign cases is 97% and in malignant cases is23-44% .[5-7]

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A Child with Ulcerative Colitis - A Case Report

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Summa1ry:

Ulcerative colitis in children has not been reported previously in Bangladesh. This case report is of a 7 year old girl who presented with frequent passage of slimy stool mixed with blood for 4 months. She also had fever, weight loss, abdominal pain and urgency at defecation. Barium enema showed pancolitis with multiple pseudopolyps and collar button appearance. Colonoscopy revealed a friable and granular mucosa with diffuse ulceration and multiple pseudopolyps. There was bloody exudate and the lumen was narrow. Histopathology findings showed necrosed tissue probably representing a base of ulcer and inflammatory cell infiltrate in the lamina propria. The crypt architecture was distorted with cryptitis and goblet cell depletion. There was no granuloma. She was diagnosed as a case of ulcerative colitis & treated with Sulfasalazine and oral corticosteroid. Her response to treatment was very well and now she is on regular follow up.

(J Bangladesh Coll Phys Surg 2010; 28: 117-120)

Introduction:

Ulcerative colitis (UC), a chronic inflammatory bowel disease of the colon is not uncommon in children[1]. The incidence of UC is 2 to 11 per 100,000 children per year[2]. Median age at diagnosis is 10 years[3]. Multiple familial occurrences are present in 15-20% of patients with no sex predilection[4]. It is thought to be a multifactorial disease. Both genetic and environmental influences are present in the pathogenesis of the disease [5]. Though it is seen frequently in Europe and North America but studies have shown that the incidence is more or less same in developed and developing countries [6]. The increased incidence is related to the rapid westernization of lifestyles as well as environmental changes caused by industrialization and urbanization [6, 7]. There are no reported cases or data from Bangladesh on this particular problem. The diagnosis, management, course and prognosis of the disease remain highly enigmatic. In view of the situation, the case is reported here for rarity.

Case summary:

A 7 year old girl was admitted in pediatric department of Dhaka Medical College Hospital on 22/07/07 with frequent passage of slimy stool mixed with blood for the last four months. The frequency was about 8-10 times per day. Additional symptoms included anorexia, tenesmus, and abdominal pain, urgency at defecation, fever and significant weight loss. For this she was seen by local physicians and treated with antibiotics on several occasions but her condition did not improve. She had no food allergies, alteration of bowel habits. She had no contact with tuberculosis neither her family history was notable.

On physical examination she looked emaciated, pale, and was febrile (101°F). Her heart rate was 100 beats / min, blood pressure (90/60 mm Hg) and respiratory rate (24/min) were normal. There was no clubbing, no lymphadenopathy and no skin lesion. Her height was 110 cm (90 % of reference value of CDC , just below 3rd centile), and weight was 13kg (56.5% of reference value of CDC, far below 3rd centile). Her oral mucosa was dry. Abdomen was slightly distended and diffusely tender but there was no rebound tenderness or guarding. No abnormality was noted in the perianal region as well

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as in the joints. Other systemic examination revealed normal.

Initial investigations showed Hb- 50%, white cell count- 9000/cu mm with normal differential and platelet count. Peripheral blood film showed microcytic hypochromic anemia, E.S.R was 80 mm in 1st hour. Her serum albumin level (2.4gm/dl) was low. Stool microscopy showed plenty of red cells and leukocytes. Stool culture was negative. Her chest X-ray was normal. Abdominal ultrasound revealed normal study. Barium enema showed pancolitis with multiple pseudopolyps and collar button appearance.

A colonoscopy was done up to the hepatic flexure which showed diffuse ulceration with multiple Pseudopolyps involving extensively from rectum to hepatic flexure. The colonic mucosa was erythematous friable and granular. There was bloody exudate and the lumen was narrow. The findings were consistent with severe colitis. Biopsy specimens showed necrosed tissue probably representing a base of ulcer and inflammatory cell infiltrate in the lamina propria. The crypt architecture was distorted with cryptitis and goblet cell depletion. There was no granuloma. So the diagnosis of Ulcerative colitis was made. She was treated with steroid and sulfasalazine from the 6th day of admission. Her symptoms of colitis begun to improve from the 3rd week of treatment and subsequently she was discharged home on steroid and sulfasalazine. Her bowel movement had normalized by the time of her out patient review 4 weeks later. The girl is now on regular follow up.

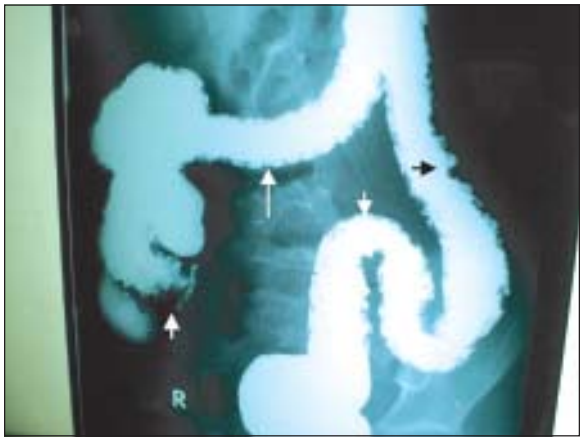

Fig. 1: *Barium enema showing serrated thorn like colonic outlines indicating microulceration which diffusely involved the whole colon. Pseudopolyps and collar button appearance signifying submucosal tracking also seen.*

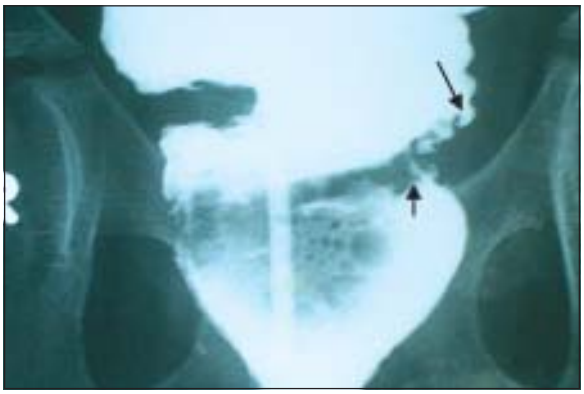

Fig.2: *Barium enema showing multiple pseudopoly, and collar button appearance (upper arrow).*

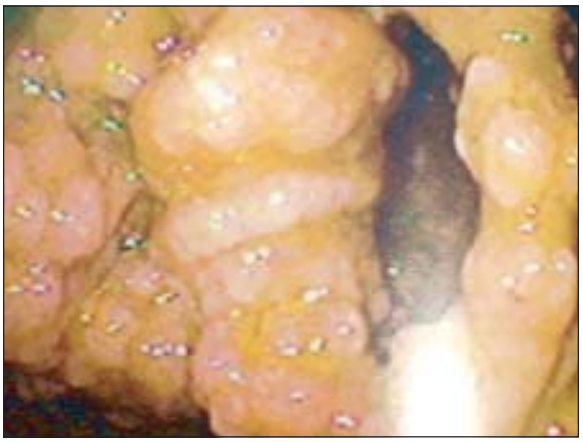

Fig.-3: *endoscopic image demonstrating multiple Pseudopolyps.*

Discussion:

Ulcerative colitis (UC) is a chronic inflammatory bowel disease of the colon characterized by remission and relapse[5]. UC and Crohn's disease comprise the spectrum of inflammatory bowel disease. It is thought to be a multifactorial disease. Both genetic and environmental influences are present in the pathogenesis of the disease[5]. An abnormality in intestinal mucosal immunoregulation may play an important role. Normally gut mucosa displays physiologic inflammation in response to constant immunologic stimulation from microbial agents and dietary antigens. In UC the mechanism that keeps

physiological inflammation in check fail and pathologic inflammation ensues. Inflammatory mediators like cytokines, arachidonic acid metabolites, reactive oxygen metabolites, growth factors etc are involved, leading to tissue destruction and remodeling with fibrosis. Most therapies are aimed at interfering with these mediators [5].

The hall mark symptoms are chronicity (>2-3 wks), abdominal cramping, diarrhea and bloody stool [5, 8]. In 50-60% cases the disease is mild affecting the distal colon only with no systemic manifestation[8]. Moderate disease is observed in 30% of patients with bloody diarrhea, cramps, urgency to defecate and abdominal tenderness. Associated systemic findings such as anorexia, weight loss, low grade fever and mild anemia are present[8,11,13]. About 10% patients present with features of severe colitis such as more then six bloody stools per day, fever, weight loss, abdominal tenderness, anemia, leucocytosis, hypoalbuminaemia. Life threatening complications like severe hemorrhage, toxic megacolon, or intestinal perforation may occur in these patients. Similarly this patient had slimy stool mixed with blood more than six times a day for four months, fever, weight loss, abdominal tenderness, anemia and hypoalbuminemia. But she did not have any complication. Very few (<5%) cases present with predominantly extra intestinal manifestations like growth failure, arthropathy, skin manifestations (pyoderma gangrenosum) or liver disease (Sclerosing cholangitis)[8].

Diagnosis of UC is based on history, clinical examination and typical endoscopic and histologic findings[5]. Infectious colitis can mimic UC, so all patients should have stool culture and stool evaluation for ova and parasites[5]. Distinguishing UC and Crohns disease (CD) is essential because treatments and anticipated complications will differ. Blood in stool is usually but not always characteristic of UC whereas CD usually present as non bloody diarrhea, extraintestinal manifestations such as clubbing, oral ulceration, fever, arthritis, erythema nodosum, growth retardation etc and perianal disease including skin tags, anal fissures, and fistulas are more common in CD[3,5,9]. Moreover endoscopic examination shows that UC often begins in the rectum and spread proximally and continuously, Pseudopolyps occur commonly, where as CD often skip some areas of bowel and spare the rectum as many as 50% of cases[2,3]. Beside this the severity of UC can be judged by colonoscopy. In mild cases only a small area of distal colon is involved. In severe cases there can be pan colitis. Although in this patient colonoscopy was performed up to hepatic flexure, usually a full colonoscopy is indicated to examine the entire colon for discontinuous areas of inflammation (Known as skip lesion) and to visualize the terminal colon. In this girl the barium enema revealed pancolitis and the colonoscopy showed diffuse ulceration with multiple Pseudopolyps involving extensively from rectum to hepatic flexure . There was no skip lesion.In UC biopsy specimen shows distortion of crypts, inflammatory cell infiltrate in lamina propria, cryptitis, crypt abscesses and goblet cell depletion. In CD the involvement is transmural and non caseating granuloma is characteristic [9]. This patient's biopsy specimens showed necrosed tissue probably representing a base of ulcer and inflammatory cell infiltrate in the lamina propria, there was no granuloma. Additionally it is often difficult to distinguish between UC and CD both endoscopically and histologically, which then diagnosed as indeterminate colitis. About 10% of affected patients will have an indeterminate colitis[5]. Allergic colitis also mimics UC, but usually presents in infancy and resolve on removal of offending protein.

The therapy for UC occurs in two steps. The first step is to induce remission and second step is to maintain remission[3, 11]. The mainstay of outpatient management of patient with mild to moderate colitis is anti-inflammatory therapy with Aminosalicylates like Sulfasalazine, Mesalamine[5,8]. The dose of Sulfasalazine is 50-75mg/kg/day (max.2 to 3 g/day).Onset of action may take several weeks[5]. The patients who have proctitis or left sided colitis only, oral and topical formulations are equally effective in achieving symptomatic control and inducing remission[3, 8,12]. But patients with mild to moderate pancolitis topical therapy are not an effective sole treatment modality because enemas rarely pass the splenic flexure[2]. The exact mechanism of action of Aminosalicylates in ulcerative colitis is unclear. However it causes modulation of prostaglandin pathways and also inhibits the production of potent inflammatory cytokines such as IL-1, TNF and interferon –ã[5]. Hypersensitivity is the major side effect, other dose related adverse reactions include nausea, vomiting, headache etc.[2,5]. Mesalamine may have fewer

side effects but it is not available in a pediatric preparation[8]. In case of severe colitis like our patient oral or IV corticosteroid must be used to induce remission and continue until symptoms abate and bowel movement normalize. The dose is then tapered gradually to an alternate day dose within 1-3 month. With medical management most child are in remission within three months[5]. The level of therapy that induced remission dictates the selection of maintenance therapy. If steroid is used to induce remission large doses of Aminosalicylates may be required to prevent relapse as steroid tapered[3, 8]. Priya was treated with Sulfasalazine and oral steroid. With this treatment she responded well. At a follow up visit 6 weeks later she reported that her diarrhea had completely resolved. There was no visible blood in the stool. She had no fever or abdominal pain. Her lab parameters also became normal. But endoscopy was not done to see the remission. Now she is on regular follow up.

Other modalities of therapy for steroid dependent or steroid resistant cases include 6-MC, Azathioprin, cyclosporine, infliximab. Surgery (colectomy) is curative in UC and performed for intractable disease, complication of therapy and fulmina[2, 3, 14]. Regular follow up is essential in these patients as the principal long term complications are primary sclerosing cholangitis and colon cancer. The annual rate of development of colon cancer is 2% after 20 years of disease and 8% after 30 years[3]. The risk can be diminished with surveillance colonscopy begaining 8-10 years of disease and detaction of significant dysplasia on biopsy would prompt colectomy.

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Series of Cases with Iatrogenic Nerve Injury

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Summary:

After introduction of EMG at Dhaka Medical Collage on January 01, 2006, a total of 415 cases referred to EMG laboratory for electrophysiological evaluation over a period of two years

(January 01, 2006 to December 31, 2007). Among these, 7 cases diagnosed as iatrogenic nerve injuries. The subtypes of iatrogenic nerve injuries were:

1. Accessory nerve injury: three, 2. Femoral nerve injury: one, 3. Sciatic nerve injury: one,

4. Lumbar sacral plexus injury: one, 5. Combined sciatic and femoral nerve injury: one

In order to investigate the causes, diagnosis & prevention of iatrogenic nerve injuries; we have reviewed 7 cases of iatrogenic nerve injuries. The peripheral nerve injuries occurred due to lack of proper awareness of medical personals. These injuries are iatrogenic injuries so it is useful to review the mode of injuries and means of prevention.

(J Bangladesh Coll Phys Surg 2010; 28: 121-124)

Introducton:

Nerve injury produces considerable disability which is often irreversible. Several patients with peripheral nerve injuries were evaluated in our EMG laboratory at Neurology Dept, Dhaka Medical College, Dhaka for localization of their lesion and for assessment of their disabilities. EMG plays very crucial role to localize the lesion, to determine the severity of lesion, duration of lesion, and to observe the sign of reinnevation that is important for prognosis.

Materials and Methods:

This retrospective study was conducted at EMG laboratory under Neurology Department of Dhaka Medical Collage. Study period was two years (January 01, 2006 to December 31, 2007). Both inpatient and outdoor patient were referred to EMG laboratory with various diagnoses.

All patients' clinical information along with some laboratory data collected and stored in Excel program and the data was reviewed. The inclusion criteria were nerve injury due to physician or medical assistant handling. Nerve injury by other means like road traffic accident, accidental injuries etc were all excluded.

After history was taken and a directed physical examination performed, a routine nerve conduction study (NCS) followed by needle electromyogram (EMG) were done on all patients.

Needle EMG cannot be planned or properly interpreted without knowledge of underlying nerve. So nerve conduction study (NCS) followed by needle electromyogram (EMG) are done together.

Nerve selected for study depends on the distribution of the patient's symptoms and sign and the differential diagnosis.

Case #1.

History & physical examination:

A 16 year old girl was referred for progressive dropping of right shoulder and also pain & weakness of right shoulder joint. There was history of cervical node tuberculoses and which was diagnosed by lymph node biopsy an age of 8 years & was treated appropriately.

Examination showed right shoulder drop with mild scapular winging when arm was abducted.

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Rest of the shoulder muscles, sternocleidomastoid muscle, reflexes & sensation were intact.

NCS & EMG diagnosis: Distal spinal accessory neuropathy (axonal)

Discussion: The most common site of injury to the spinal accessory nerve occurs in the region of the posterior cervical triangle, where the nerve runs superficially [1]. A lesion at this site results in shoulder drop and atrophy of the trapezium muscle, with sparing of the sternocleidomastoid muscle[1, 2, 3, and 4.]

Anatomy[1, 2, 3, 4.] : The spinal accessory nerve originates from the C1-C4 roots, ascending through the foramen magnum then returning via the jugular foramen. The nerve first innervates the sternocleidomastoid muscle before running over the posterior cervical triangle to innervate the trapezius muscle. There are no cutaneous sensory innervations. Accessory nerve injury produces considerable disability [6]. The nerve is most frequently damaged as a complication of radical neck dissection, cervical lymph node biopsy and other surgical procedures around the neck [6, 7, 8,] .

We had 3 patients, all of them had cervical lymph node biopsy so surgeons should be very careful during the operation to prevent distal portion of spinal accessory nerve injury. Even if the injury had happened, it should be recognized as early possible to prevent disability. Early surgical repair has the greatest chance of recovery and success [6].

Case # 2:

History & physical examination:

A 50 year old obese female presented with right foot drop for 6 month. And was unable to stand without support on her right leg or get up from sitting posture. Her problem started 6 months later after she had hysterectomy, which was done for menorrhagia. After this operation she developed progressive weakness of her right leg and while standing her knee would buckle up. And since then she could not stand on her right foot and gradually symptom progressed to present condition. When seen 6 month later, her neurology examination, showed a complete foot drop or no movement of ankle or great toe, hip abduction, hip flexion, hip extension, hip lateral rotation, and knee flexion, knee extension (0-1/5). Sensory exam showed reduced sensation throughout her right lower extremity. Ankle & knee reflexes were absent.

NCS& EMG diagnosis: Chronic lesion (axonal) of the right lumbosacral plexus.

Discussion:

Anatomy[1, 2, 3, and 4]: The anterior rami of L1 –S3 roots come together to from the lumbosacral plexus, from which all major lower extremity nerves are derived.

Lumbosacral plexopathy can he caused by structural and nonstructural lesion like surgical procedure especially when retractors are used. Most likely this had happened to this patient, who had undergone pelvic surgery for hysterectomy.

Case # 3:

History & physical examination:

A 20 year old boy presents with slight dragging of right leg. He had a history of high fever when he was 8 years old and was given 10 days IM shot at buttock, which was given by village doctor.

Local examination of his buttock region showed mild atrophy of his gluteus maximums muscle.

On examination all were normal except muscle bulk below knee was mildly reduced on right side with some weakness of right ankle and toe dorsiflexion (3/5) as foot inversion. Ankle and toe planer flexion, knee extension, and all movements around the hip were symmetric. Sensory examination showed reduced sensation of right leg below knee except medial side of leg which was normal.

NCS & EMG Diagnosis: Chronic sciatic (axonal) neuropathy.

Discussion: Sciatic nerve injury is not so common in western countries. But in our country it is relatively common. It is due to failure to give IM shot at proper location i.e. upper outer quadrant. So the nerve can be injured by misplaced shot. Intramuscular injection to gluteal muscle should be strictly localized to upper outer quadrant.

Case # 4:

History & physical examination:

A 58 year old nondiabetic, non hypertensive obese man presented with progressive difficulty in standing or keep weight on right leg for 6 weeks after undergoing elective cardiac catheterization for his chest pain. The patient

also noted that his leg would occasionally buckle, and he had nearly fallen several times. He also experienced a pins and needles sensation in the front of the thigh, radiating to the inner calf. There was no significant pain in the leg. There were no symptoms in his left leg

On examination muscle bulk and tone were normal. Strength test showed normal strength in all muscles including hip flexion, ankle dorsiflexion, thigh adduction & knee extension were normal but when the patient was subsequently asked to arise from the kneeling position, he was unable to do so leading with the right leg, but could easily do so on the left side. (To demonstrate subtle weakness this test is done.) Sensory examination showed mildly reduced sensation over the anterior thigh and medial calf and sole of the foot were normal.

NCS & EMG Diagnosis: Sabacute femoral neuropathy (both demyelination & axonal lesion).

Discussion:

Isolated lesions of the femoral nerve are not often seen in the electromyography (EMG) laboratory. More common are lesions of the lumber plexus or L2-4 nerve roots, which may present with similar symptoms and signs of femoral neuropathy. Especially in milder cases, differentiating between these three types of lesions may be difficult. The EMG serves two major roles in suspected lesions of the femoral nerve: first to localize the lesion, which often suggests the correct diagnosis, and second, to assess the severity and degree of axonal loss, which has direct implications for the prognosis and duration of disability [1].

Anatomy [1, 2, 3 and 4]: The femoral nerve is derived from lumber plexus and receives innervations from L 2, L 3 and L 4 nerve roots. Muscular branches are given off to the psoas and then to the iliacus muscle, before the nerve runs beneath the inguinal ligament. It then divides into motor & sensory branches. Motor branches innervate the sartorius and pectineus muscles and the four heads of quadriceps. Sensory branches of the femoral nerve supply medial and anterior thigh and medial calf (Saphenous). Most cases of femoral neuropathy result from positioning or compression during abdominal or pelvic surgery [10]. Retractions used during surgery may result in compression of the femoral nerve against the pelvis. Compression can also occur at the inguinal ligament if patient is placed in lithotomy position for prolong period during surgery. Otherwise isolated femoral neuropathies are uncommon. Iatrogenic femoral neuropathy can occur in the inguinal region from misguided femoral catheterization as a consequence of hematoma formation, which happened to our patient. Femoral neuropathy may also occur in patients with diabetes mellitus, presumably from nerve infarction, this usually occurs in the setting of a more widespread polyradiculoplexopathy (I.e. diabetic amyotrophy).

The nerve conduction studies and EMG demonstrate a postganglionic lesion of the femoral nerve, most likely at the inguinal region. The preserved hip flexion strength correlates with the normal EMG examination of the Iliopsoas. This finding is important in excluding a lesion proximal to the inguinal ligament. By suggesting that the lesion is at the inguinal region ligament, the EMG is helpful in determining that the most likely etiology of the neuropathy is at the inguinal region from misguided femoral catheterizations as a consequence of hematoma formation. So physician doing catheterization should know this iatrogenic injury of femoral nerve, so that they can avoid the injury.

Case # 5:

History and physical examination:

A five year old boy presents with unable to stand on his left leg. He had a history of left leg fracture at mid thigh after a fall from a height. It was treated with cast for several weeks. After the cast was removed he could walk with slight dragging of his left leg. His grandma felt a slight elevation of the bone at the fracture site so she took her grandson to a village doctor to fix the slight elevation of the fracture site.

The village doctor tied a rope tightly around the thigh at the elevation site and told her to keep the tie for 12 hours.

After few hours the boy started complaining pain at left leg & wanted to take off the rope. He was given some sweets to cool him down. And then the tie was removed after 12 hours. After removing the tie the boy could not bear weight on that leg and kept his knee semi flexed.

On examination there was mild atrophy of left leg with mild flexion of left knee with complete foot drop. Toe, ankle dorsiflexion as well as knee flexion were absent. Hip flexion, extension, abduction & adduction were normal. Deep tendon reflex was absent. Sensory was absent in whole leg.

NCS & EMG diagnosis: Severe injury (axonal) of left femoral, obturator & sciatic nerve with its branches i.e. tibial & peroneal nerve

Discussion:

Anatomy [1, 2, 3, and 4]: - The sciatic nerve is derived from the L4 – S3 roots, carrying fibres that will eventually become the tibial and common personal nerves. It leaves the pelvis through the greater sciatic foramen under the piriformis muscle accompanied by the other branches of the lumbosacral plexus (inferior and superior gluteal nerves and posterior cutaneous nerve of the thigh. The sciatic nerve next runs between the ischial tuberosity and the greater trochanter of the femur covered by the gluteus maximus. The knee flexors including the semimembranosus, semitendinosus and long and short head of biceps femoris and the lateral division of adductor magnus, are all supplied by the sciatic nerve. The sciatic nerve terminates in the popliteal fossa where it divides into the common peroneal and tibial nerves, supplying all motor and sensory innervations below the knee, with the exception of sensation over the medial calf and foot (saphenous sensory territory)

Sciatic neuropathy is distinctly uncommon and usually suggests a structural etiology. One of the most common causes of sciatic neuropathy is tumor (neurofibroma, schwannoma, neurofibrosarcoma, lipoma, lymphoma), which is usually imaged quite well as a mass lesion on computed tomography (CT) or magnetic imaging (MRI) scanning. Damage of the sciatic nerve can also occur from trauma or as a result of a penetrating injury, such as gunshot and knife wounds. Damage to the sciatic nerve may also occur iatrogenically from misplaced intramuscular buttock injections, as in our case no. 3. Here in our patient damage happened due to pressure from the tie.

Cases reported where peripheral nerve injury occurred due to the pressure of a restraint buckle causing a postoperative motor and sensory deficit. But our case was due to ignorance, that a healed fracture site was thicker from surroundings.

Conclusion:

Iatrogenic injury is preventable. So knowing proper anatomy and also disease process, it can be easily avoided. Even if the injury had happened, it should be recognized as early as possible to prevent disability. Early surgical repair has the greatest chance of recovery and success. It is the responsibility of physician, attending doctors, medical assistance and especially surgeons. And their careful manipulation during operation and knowledge of regional anatomy were the key to prevent nerve injuries. To recognize the injury and to localize the lesion, nerve conduction study (NCS) along with electromyogram (EMG) should be done. Awareness of iatrogenic injury and its consequences should be emphasized for prevention. And early diagnosis and management improves the outcome.

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Dual Right Coronary Artery Associated with ASD and Pulmonary Stenosis

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Introduction:

Coronary artery anomalies occur in less than 1% of the cases undergoing coronary angiography, and constitute 1-2% of all congenital heart disease.[1] The origin of the circumflex artery from the right coronary artery (RCA) or the right sinus of Valsalva is the most commonly encountered anomaly and is usually well tolerated [2]. We report the clinical , echocardiographic and angiographic findings of symptomatic 45 years elderly lady with the atrial septal defect and double right coronary artery and pulmonary stenosis. To our knowledge, such associated lesion as founding this case has not been reported in the literature till date at home and abroad.

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Case Report:

A 45 years, non diabetic, non hypertensive lady presented with the palpitation for 2 years. The palpitation used to occur during exertion and relieved by rest and was associated with generalized fatigability. She has no history of chest pain, dizziness, dyspnoea, edema, features of hyperthyroidism, anxiety disorders. On general examination, her pulse was 88beats/min regular, Blood pressure 120/80 mm of Hg, prominent a wave in JVP. Precordium examination revealed left parasternal lift, wide fixed splitting of second heart sound, ejection systolic murmur in the left upper sternal border best heard in inspiration. Other systemic examination was unremarkable. Our clinical diagnosis was ASD with Pulmonary stenosis.

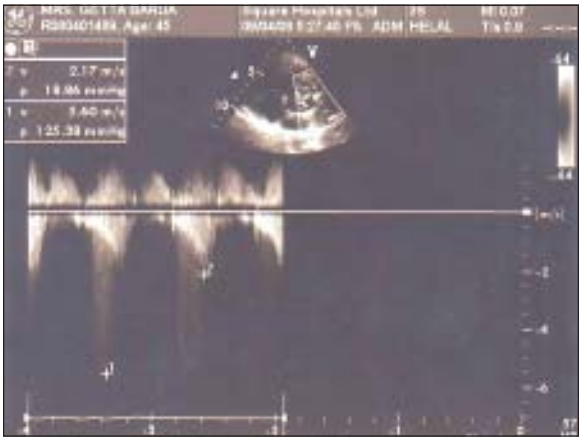

Fig.-1: *Doppler Echocardiography of 45 years elderly lady showing increased pressure gradient across the pulmonary valve.*

Fig.-2: *Transoesophageal Echocardiography of the same lady showing atrial septal defect osteum secondum type.*

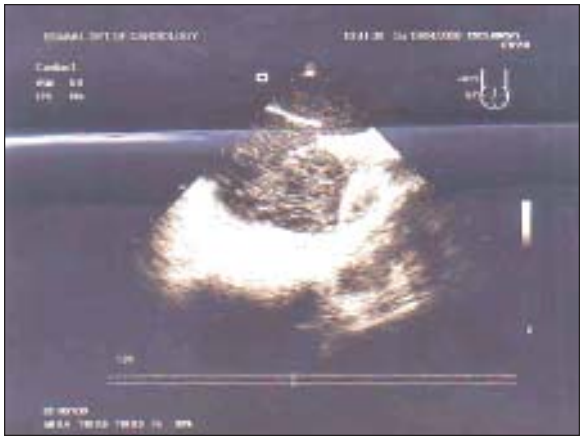

Fig.-3: *Transesophageal echocardiography of the same lady showing passage of air bubble from RA to LA through atrial septal defect.*

Her ECG showed right bundle branch block with right axis deviation and right ventricular hypertrophy. Transthoracic echocardiography showed dilated right atrium and right ventricle with right ventricular hypertrophy, pulmonary stenosis and pressure gradient of 125mm Hg across the pulmonary valve. Transesophageal echocardiography showed ostium secondum variety of atrial septal defect of 8.2mm size and air bubble passed from right atrium to left atrium.

Subsequently she underwent right heart catheterization during which the catheter passed from right autrium to left autrium, significant step up of oxygen on oxymetry was noted in mid right autrium and. Her Qp:Qs ratio was 0.9.Coronary angiogram was also done and revealed normal left main ,LCx, LAD and 2 right coronary arteries with single normal anatomical osteum and both RCA with their branches are normal and disease free.

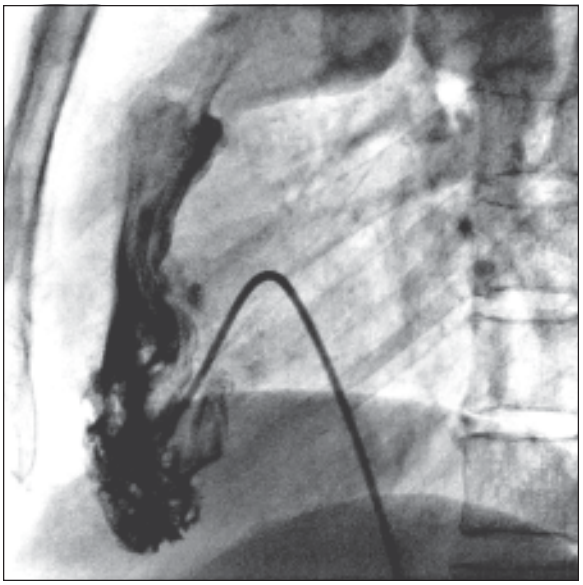

Fig.-4: *Right vetriculography(Lateral View) of the same lady showing Pulmonary stenosis of infundibular and valvular type.*

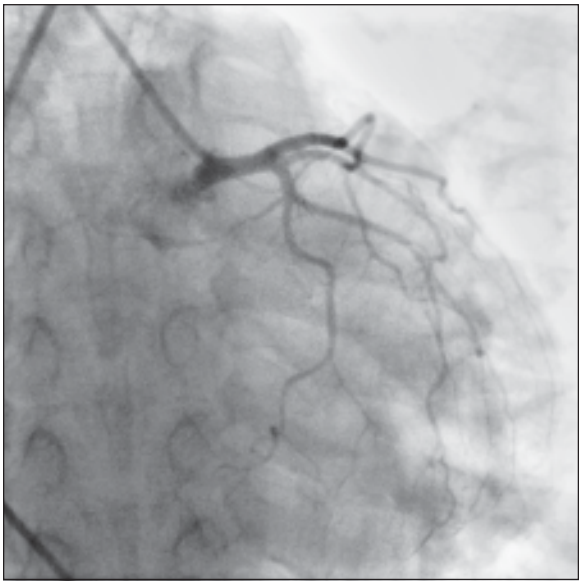

Fig.-5: *Coronary angiography of the same lady showing normal left coronary arterial system.*

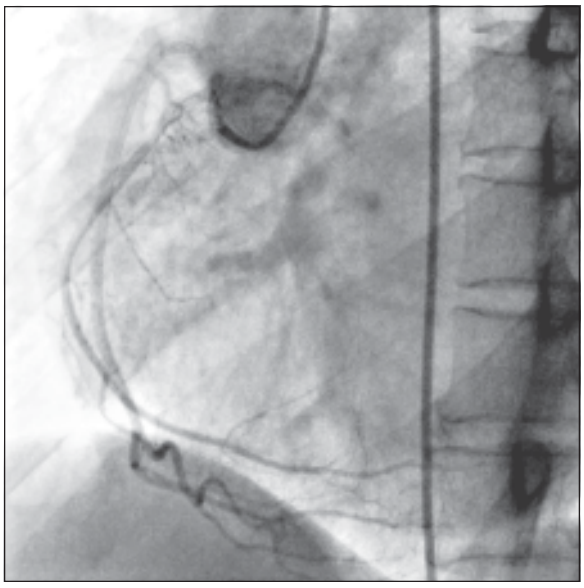

Fig.-6: *Coronary angiogram of the same patient showing double right coronary arteries with single normal anatomical ostium .Just after the origin there is duplication and both the arteries with their branches are normal and disease free.*

Discussion:

Coronary artery anomalies are encountered in less than 1% of the cases undergoing coronary angiography and in approximately 0.3% of autopsy series [3-5]. There is generally no gender difference in the incidence, and the most commonly encountered anomaly is the ectopic origin of coronary arteries [4].

The duplication of the RCA is extremely uncommon, and up to now, only nine cases have been reported [6]. Duplication of coronary arteries is accepted as a benign pathology. In RCA duplication, each artery may arise from a separate ostium or from the main trunk during the initial course of the RCA, and generally runs parallel, or one of them may course towards the anterolateral surface of the right ventricle. Coexistence of premature atherosclerosis as a result of altered blood flow kinetics has been a controversial issue [7,8].Among the previously reported cases of double RCA, there were only two patients with coexistent anomalies[9,10] and one patient with atherosclerosis[11]. Serkan T et al reported a case of ventricular septal defect and double right coronary artery originating from the left main coronary artery and the right coronary sinus [12]. In our case, there are two right coronary arteries with origin from the same osteum and are disease free.This anomaly is associated with ASD ostium secondum type and pulmonary stenosis. Such interesting coronary artery anomaly associated with other congenital heart disease, to our knowledge, is the first reported case in the world.

Conclusion:

Dual Coronary artery anomalies associated with other congenital heart disease is a rare condition. One should be cautious to evaluate such a patient during invasive and non invasive diagnostic procedures for proper management of such patient.

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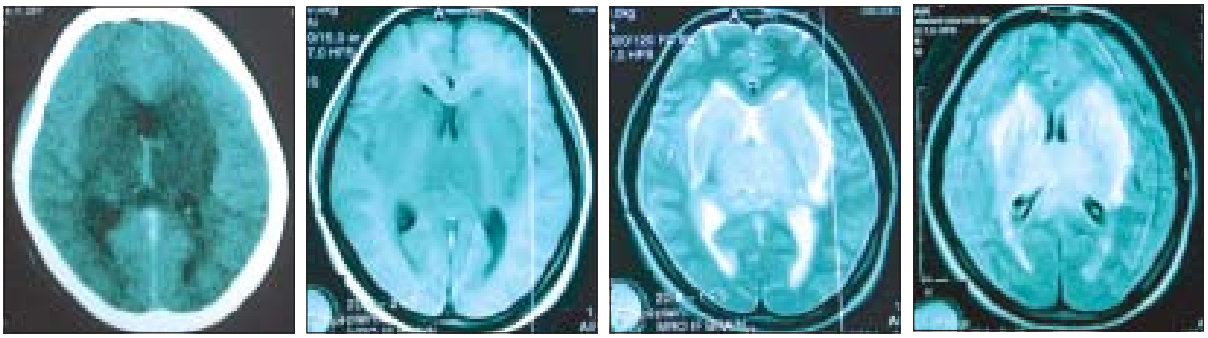
12 Serkan T et al. Double Right Coronary Artery Arising From the Left Main Stem and Right Coronary Sinus Associated with Ventricular Septal Defect in an Adult: An Extremely Rare Case. Heart, Lung and Circulation:16:4: 2007, 318-321.

Images in Medical Practice

(J Bangladesh Coll Phys Surg 2010; 28: 128)



a **b** **c** **d**

A 15-year-old previously healthy girl developed unconsciousness and repeated generalized convulsion 12 hours after taking an unknown herbal substance from a local traditional healer. But she had no history of fever, headache, vomiting. Patient was found to be unresponsive (GCS-5/15). Blood pressure, pulse and temperature were normal but she had quadriparesis, areflexia and bilateral extensor planter reflexes. The pupilary reaction was sluggish with normal fundal examination. Her all routine blood biochemistry and CSF examination reports were normal. An initial CT scan of the brain (fig-a) showed extensive white matter changes throughout the frontal and parietal lobes. In addition, areas of lower density lesions involving the basal ganglia bilaterally. T1-weighted axial MRI of the brain (fig-b) showed decreased signal in cerebral white matter, especially in frontal, parietal areas and putamens. T2-weighted (fig-c) and FLAIR weighted (fig-d) MRI showed increased signal in cerebral white matter and in both putamen suggestive of non-haemorrhagic necrosis.

Majority of toxin induce encephalopathy involve the optic nerve and the central nervous system with a predilection for basal ganglia, resulting in symptoms of visual disturbances, blindness, drowsiness, seizures and coma.[1] Bilateral necrosis of the putamen with white matter changes has been reported as characteristic in brain imaging.[1,2]

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d) **Prof. Quazi Tarikul Islam**, Professor, Department of Medicine, Dhaka Medical College Hospital, Dhaka.

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Are Oral Hypoglycemic Agents Contraindicated in Pregnancy!

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RUBINA YASMIN[a], MD FAIZUL ISLAM CHOWDHURY[b], MD AMINUL HOQUE[b]

Summary:

The incidence of gestational diabetes is increasing. There has been a traditional reluctance to recommend oral antidiabetic drugs for the management of hyperglycaemia in gestational diabetes mellitus The medical management of gestational diabetes is still evolving, and recent randomized controlled trials have given a glimse of hope for woman who likes to avoid insulin and prefer oral agents.. As insulin therapy is considered the gold standard of pharmacotherapy for gestational diabetes, it becomes a usual recommendation to use it in pregnanacy. The current short acting insulin analogs lispro and aspart are safe, but there are only limited data to support the use of long acting insulin analogs. There are randomized controlled trials which have demonstrated efficacy of the oral agents glyburide and metformin. Whilst short-term data have not demonstrated adverse effects of glyburide and metformin on the fetus, and they are increasingly being used in pregnancy, there remain long-term concerns regarding their potential for harm. This controversy related article gives an overview of the rationale for use of oral antidiabetic agents in the treatment of gestational diabetes.

(J Bangladesh Coll Phys Surg 2010; 28: 129-131)

Discussion:

In a policy statement by the American Diabetes Association and the American College of Obstetricians and Gynecologists in 2004 revealed "Oral glucose lowering agents have generally not been recommended during pregnancy"[1]. Conventionally, treatment has been offered in the form of dietary management with insulin added if diet alone does not achieve acceptable glycaemic levels. The statement is based on first-generation sulfonylureas (tolbutamide and chlorpropamide) which can easily cross the placenta leading to almost similar cord and maternal serum concentrations[2]. Early experience with these drugs included numerous cases of profound and prolonged neonatal hypoglycemia.[3] Retrospective studies of series of women with type 2 diabetes mellitus suggested an association between first-trimester sulfonylurea therapy and major congenital malformations[4,5]

Most centers followed the American lead of O'Sullivan from the early 1970s in which dietary management was combined with a single dose of intermediate acting insulin. The consensus about this management was challenged by the classic randomised controlled trial of Persson and colleagues in 1985. The outcomes in relation to birthweight, frequency of foetal macrosomia, newborn skinfold thicknesses and common neonatal complications, respiratory distress, hypoglycaemia, hyperbilirubinaemia and polycythaemia were not significantly different between the groups. With so much controversy, why oral therapy still needed? Insulin therapy is associated with: I.. the fear of injections (particularly when multiple).II. the issue of compliance. III. the risks of hypoglycemia. IV. The increase in appetite and weight. So the next question arises is what to do? The solution is: 1. We need oral drugs which do not cross the placenta and 2. Oral drugs which cross the placenta without causing fetal hypoglycemia, hyperinsulinemia. and teratogenic effects.

The case of Glyburide (Glibenclamide) then came into play. Using an isolated perfused human placental model, Elliott et al. demonstrated minimal placental transfer of glyburide, but greater transport of glipizide and particularly chlorpropamide and tolbutamide[6,7]. Then a comparison of glyburide and insulin in women with gestational diabetes mellitus was done [8]. The results of

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which showed there were no significant differences in mean neonatal glucose concentrations, macrosomia, neonatal intensive care unit (NICU) admission, or fetal anomalies (Table I).

Table-I

Comparison of insulin versus Insulin in Langer study

	Glyburide group	Insulingroup
1. Fetal anomaly	2%	2%
2. Large for gestational age	12%	13%
3. Lung complications	8%	6%
4. Hypoglycemia	9%	6%
5. Admission in Neonatal ICU	6%	7%

Further reports of five small retrospective reports of glyburide use for GDM have been published since 2000.[9,10,11,12,13]. Summary of those studies showed similar results of glyburide treatment, compared with insulin. In 2005 Langer reanalyzed the results of his trial. The rate of macrosomia was 16 vs. 5% (*P* 0.01), respectively, in the high and low

glyburide dose groups.[14]

The metformin use in pregnancy was also scrutinized critically as metformin was shown to be able to significantly cross the placenta, with fetal concentrations in the range of half of maternal concentrations[15]. However, it does not stimulate insulin secretion or release, and does not cause hypoglycemia, enhances insulin action.Several trials did not report any major congenital malformations in infants born to mothers who received metformin throughout pregnancy, whether those mothers were diabetics[16,17] or non diabetics[18]. Several studies in South Africa more than 20 years ago[19,20] and in New Zealand in 2006[21] reported no adverse pregnancy outcomes. The largest trial of metformin against insulin, popularly known as MiG study is completed and the results of which are published.[22]. It would therefore seem that there is a place for the use of metformin in the management of gestational diabetes. Metformin reduces pregnancy-associated weight gain compared with the alternatives. There was no excess of neonatal hypoglycaemia in the metformin group or of respiratory distress syndrome, birth trauma, or low Apgar scores. A MEDLINE search (1966-March 2007) showed oral antidiabetic agents in pregnancy and lactation is on way of paradigm shift[23]. It showed neither glyburide nor metformin has caused developmental toxicity in humans. Glyburide has been used for the treatment of gestational diabetes, and metformin has been used in women with PCOS who eventually became pregnant. Such data on the use of OHAs in pregnancy are shifting the paradigm that once stated that they should never be used in pregnancy. This shift may be welcome to women with gestational diabetes who are inconvenienced by injections and to those in areas where insulin may not be readily available or is cost prohibitive. But there are notable limitations to the current literature .First, there are possible publication biases. Though published and unpublished studies show no differences between groups-this is due to small groups included in the studies. Large group studies are needed to delineate the real picture.

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LETTER TO THE EDITOR

(J Bangladesh Coll Phys Surg 2010; 28: 132-133)

A case report regarding 'Yellow Nail Syndrome' was published in Jan,2010 Vol. 28, No 1: 49-52 in the Journal of Bangladesh College of Physician and Surgeons.

To the editor in chief: we have gone through the case report and we have few important comments on this report:Yellow nail syndrome is a triad of deformed yellow nails, lymphoedema and pleural effusion.[1] This is an infrequently reported clinical entity. The three separate varities may manifest in widely varying times. [2]Patients may not present with the 'classical triad of syndromes. Age of onset varies and has been reported from antenatal to 65 years. [3]The basic abnormality in this syndrome appears to be ' hypoplasia of the lymphatic vessels which is responsible for lymphoedema, nail change and pleural effusion. [4]Respiratory manifestations also may include allergic rhinosinusitis and bronchiectasis and lower respiratory tract infections. Yellow nails are found in 89%, lymphedema in 80% and pleural effusion in 36%. These three findings are concurrently seen in only one third patients. [5]The diagnosis is made when patients has chronic pleural effusion in conjunction with yellow nails and lymphedema. Diagnosis may be difficult or missed as patients may not present with all the features of the syndrome simultaneously or present with each aspect of the syndrome in different departments.Increasing awareness of this syndrome and close scrutiny of the nails in patients having idiopathic and recurrent pleural effusion and lymphedema of the legs will avoid diagnostic delay and other unnecessary treatment modalities.

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Dr. Rukhsana Parvin
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Author's Reply

Many thanks for asking for my comments. The reply is perfect complimentary statements. No reply from the author is needed. The letter can be published as it is !

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"Medical Treatment of Rheumatoid Arthritis: A review" of the Journal of Bangladesh College of Physicians and Surgeons, January 2010, volume 28, no. 1

To the Editor-in-Chief: I have read with interest the review article titled "Medical Treatment of Rheumatoid Arthritis- A review". I would like to draw your attention to the new advancement that has occurred in the field of Rheumatoid Arthritis in recent past. It has long been known that TNF, IL-1, IL-6 and many other cytokines are closely related with the pathogenesis of RA. IL-6 promotes inflammatory events through the expansion and activation of T cells and the differentiation of B cell.[1] Severe RA is commonly associated with thrombocytosis, hypergamma-globulinemia, and elevated erythrocyte sedimentation rate (ESR) and CRP levels. Such abnormalities tend to rise in parallel with plasma and synovial levels of IL-6.[2] Consistent with these data, therapeutic studies in which the effects of IL-6 are blocked have noted improvements in clinical and laboratory variables. Tocilizumab is a novel

antibody therapy that competitively inhibits the binding of IL-6 to its receptor. Inhibiting the entire receptor complex prevents IL-6 signal transduction to inflammatory mediators that summon B and T cells.[1,3]

A Phase II, double-blind trial was conducted with 359 European patients who had active RA despite methotrexate therapy. The best results for monotherapy were seen with tocilizumab 8 mg/kg, with a 63% ACR20 response, a 41% ACR50 response, and a 16% ACR70 response; however, when tocilizumab was combined with methotrexate, the ACR responses improved (74%, 53%, and 37%, respectively), approximately twice the responses seen with methotrexate plus placebo.[4] The Study of Active Controlled Monotherapy Used for Rheumatoid Arthritis, An IL-6 Inhibitor (SAMURAI), a Phase III study, compared the effects of Tocilizumab 8 mg/kg with conventional disease-modifying anti-rheumatic drugs (DMARDs) on the progression of structural and joint damage over 52 weeks of treatment. After treatment, markers of disease activity were reduced: joint spaces had narrowed less, and ACR20, ACR50 and ACR70 responses significantly improved in the tocilizumab group compared with the DMARD group. Hence, it appears that tocilizumab also has a benefit for patients in terms of radiographic progression of disease.[5]

Since IL-6R inhibition has a distinct mechanism of action, some patients who do not respond to anti-TNF agents or who respond partially may be expected to respond to Tocilizumab. On January 8, 2010 the US FDA approved tocilizumab for the treatment of adult patients with moderate to severely active rheumatoid arthritis who have had an inadequate response to one or more TNF blockers. Tocilizumab is now currently available in Bangladesh and it will further enrich the armory of Internists and Rheumatologists for the management of RA.

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Author's Reply

I thank Dr. Md. Azizul Haque for his interest in my article. I was delighted to read his letter giving information about a very recent advancement in the medical treatment of RA with Tocilizumab. Tocilizumab, a humanized anti-IL 6 receptor, after phase I I I studies, has been very recently (January 8, 2010) approved by US FDA and it is now available in Bangladesh. I reviewed the medical treatment of RA including the biological agents available at the time of submission (several months ago) of the manuscript of this article, although details of each of these novel agents were not given due to lack of space. However, I gladly accept the additional information he has provided.

Dr. A.H.M. Feroz
Associate Professor of Medicine
Shaheed Suhrawardy Medical College, Dhaka

COLLEGE NEWS AND CPD PROGRAMME

(J Bangladesh Coll Phys Surg 2010; 28: 134-139)

Examination news:

Result of FCPS Part-I, FCPS Part-II and MCPS examinations held in January 2010 are given bellow :

3140 candidates appeared in FCPS Part-I examination held in January 2010 of which 512 candidates come out successful, subject wise result are as follows:

FCPS Part –I Examination:

Sl. No.	Subject	Appeared	Pass	% of Pass
1.	Medicine	917	89	9.71
2.	Surgery	474	97	20.46
3.	Paediatrics	360	68	18.89
4.	Obst. & Gynae	738	160	21.68
5.	Otolaryngology	78	20	25.64
6.	Ophthalmology	82	19	23.17
7.	Psychiatry	13	2	15.38
8.	Anaesthesiology	82	4	4.88
9.	Radiology	42	6	14.29
10.	Radiotherapy	12	2	16.67
11.	Dermatology and Venereology	77	13	16.88
12.	Physical Medicine & Rehabilitation	19	2	10.53
13.	Dentistry	188	21	11.17
14.	Family Medicine	2	0	0.00
15.	Haematology	19	9	47.37
16.	Biochemistry	4	0	0.00
17.	Microbiology	15	0	0.00
18.	Histopathology	15	0	0.00
19	Transfusion Medicine	3	0	0.00
	Grand Total	**3140**	**512**	**16.31**

The following candidates satisfied the Board of Examiners and are declared to have passed the FCPS Examinations held in January 2010 subject to confirmation by the council of Bangladesh College of Physicians and Surgeons

Roll No.	Name	From where Graduated	Subject
015-8501	Md. Azizur Rahman	Dhaka Medical College, Dhaka	Pulmonology

The following candidates satisfied the Board of Examiners and are declared to have passed the FCPS - II Examinations held in January 2010 subject to confirmation by the council of Bangladesh College of Physicians and Surgeons

Roll No.	Name	From where Graduated	Subject
076-7001	Abul Kalam Azad	MAG Osmani Medical College, Sylhet	Anaesthesiology
076-7003	Dr. Md Golam Murshid	Rajshahi Medical College	Anaesthesiology
076-7004	Dr. Md Idris Ali	Rajshahi Medical College, Rajshahi	Anaesthesiology
076-7006	Dr. Muhammad Sazzad Hossain	Chittagong Medical College, Chittagong	Anaesthesiology
076-7007	Md Kamrul Hasan	Dhaka Medical College, Dhaka	Anaesthesiology
076-7009	Khondker Iqbal Karim	Sir Salimullah Medical College, Dhaka	Anaesthesiology

Roll No.	Name	From where Graduated	Subject
076-7010	Dr. M Younus Ali	Mymensing Medical College, Mymensing	Anaesthesiology
076-7012	Dr. Md.Qamruzzaman	MAG Osmani Medical College, Sylhet	Anaesthesiology
076-7013	Khaleda Akter	Dhaka Dental College, Dhaka	Conservative Dentistry and Endodontics
076-7015	Shirin Sultana Chowdhury	Dhaka Dental College, Dhaka	Conservative Dentistry and Endodontics
076-7016	Rafia Nazneen	Pioneer Dental College, Dhaka	Conservative Dentistry and Endodontics
076-7019	Ishrat Bhuiyan	Dhaka Dental College, Dhaka	Dermatology and Venereology
076-7036	Farzana Rahman	Dhaka Medical College, Dhaka	Haematology
076-7040	Munim Ahmed	Jahurul Islam Medical College, Bajitpur	Haematology
076-7053	Abu Saleh Ahmed	Dhaka Medical College, Dhaka	Medicine
076-7125	Mahboob Mustafa Zaman	Dhaka Medical College, Dhaka	Medicine
076-7149	Dr. Syeda Nur-E-Jannat	Dhaka Medical College, Dhaka	Medicine
076-7156	Dr. Shuvashis Gupta	MAG Osmani Medical College, Sylhet	Medicine
076-7172	Dr. Muhammad Abdur Rahim	Sir Salimullah Medical College, Dhaka	Medicine
076-7193	Mostafa Noor Mohsin	Institute of Applied Health Science, under USTC, Chittagong	Medicine
076-7211	Mohammad Liakat Ali Liton	Mymensing Medical College, Mymensing	Medicine
076-7262	Syed Atiqullah	Dhaka Medical College, Dhaka	Medicine
076-7269	Sharif Uddin Ahmed	Dhaka Medical College, Dhaka	Medicine
076-7284	Rajib Biswas	Rangpur Medical College, Rangpur	Medicine
076-7335	Dr. Alamgir Mustak Ahammad	MAG Osmani Medical College, Sylhet	Medicine
076-7338	Dr. Ahmed Manadir Hossain	Rangpur Medical College, Rangpur	Medicine
076-7358	Dilruba Yeasmin	Chittagong Medical College, Chittagong	Obst and Gynae
076-7398	Dr. Rina Rani Saha	Rajshahi Medical College, Rajshahi	Obst and Gynae
076-7474	Nafisa Shamsun Nahar	Dhaka Medical College, Dhaka	Obst and Gynae
076-7490	Mst Fatema Khatun	Rajshahi Medical College, Rajshahi	Obst and Gynae
076-7525	Sultana Sayeda Akhter	Chittagong Medical College, Chittagong	Obst and Gynae
076-7529	Sujan Kumar Sarkar	Sher-E-Bangla Medical College, Barisal	Obst and Gynae
076-7559	Sayera Akhter	Sher-E-Bangla Medical College, Barisal	Obst and Gynae
076-7573	Ruma Sengupta	Foreign Medical College	Obst and Gynae
076-7585	Zebunnessa Parvin	Sher-E-Bangla Medical College, Barisal	Obst and Gynae
076-7600	Khaledun Nessa	Sir Salimullah Medical College, Dhaka	Obst and Gynae
076-7601	Khaleda Nasreen	Sir Salimullah Medical College, Dhaka	Obst and Gynae
076-7607	Kawsar Nigar	Mymensing Medical College, Mymensing	Obst and Gynae
076-7631	Ferdous Marjan	Dhaka Medical College, Dhaka	Obst and Gynae
076-7632	Ferdous Ara Banu	Dhaka Medical College, Dhaka	Obst and Gynae
076-7643	Farida Khan	MAG Osmani Medical College, Sylhet	Obst and Gynae
076-7649	Farhana Hossain	Dhaka Medical College, Dhaka	Obst and Gynae
076-7652	Dr. Hasna Hena Pervin		Obst and Gynae
076-7654	Dr. Fatema Rahman	Sir Salimullah Medical College, Dhaka	Obst and Gynae
076-7657	Dr. Farhana Afroz Chomon	MAG Osmani Medical College, Sylhet	
076-7661	Dr. Bipul Kumar Biswas	Sir Salimullah Medical College, Dhaka	
076-7663	Dr. Bedoura Sharmin	Sir Salimullah Medical College, Dhaka	Obst and Gynae
076-7676	Dr. Md. Nazrul Islam	Mymensing Medical College, Mymensing	Ophthalmology
076-7681	Md Siddiqur Rahman	Rajshahi Medical College, Rajshahi	Ophthalmology
076-7689	Shamsher Ahmed		Ophthalmology
076-7694	Dr. Golam Shah Newaz		Ophthalmology
076-7698	Abdullah Al Masud	Dhaka Dental College, Dhaka	Oral and Maxillofacial Surgery

Roll No.	Name	From where Graduated	Subject
076-7699	Farzana Quasem	Dhaka Dental College, Dhaka	Oral and Maxillofacial Surgery
076-7700	Md Mahbub Alam	Rajshahi Medical College, Rajshahi	Orthodontics and Dentofacial Orthopaedics
076-7701	Abu Hena Mohammad Parvez Humayun	Mymensing Medical College, Mymensing	Otolaryngology
076-7715	S. M. Tareq Uddin Ahmed	Dhaka Medical College, Dhaka	Otolaryngology
076-7721	Mohammad Shah Kamal	Sher-E-Bangla Medical College, Barisal	Otolaryngology
076-7727	Dr. S M Sarwar	Foreign Medical College	Otolaryngology
076-7747	Dr. Md Delowar Hossain	MAG Osmani Medical College, Sylhet	Paediatrics
076-7765	Saida Binte Rahman	MAG Osmani Medical College, Sylhet	Paediatrics
076-7779	Muhammad Zahangir Alam	Sir Salimullah Medical College, Dhaka	Paediatrics
076-7780	Mst. Naznin Sarker	Dhaka Medical College, Dhaka	Paediatrics
076-7786	Md. Shamsuzzaman	Sir Salimullah Medical College, Dhaka	Paediatrics
076-7799	Md Rabiul Hasan	Dhaka Medical College, Dhaka	Paediatrics
076-7806	Jebunnesa	MAG Osmani Medical College, Sylhet	Paediatrics
076-7820	Eva Jesmin	Rangpur Medical College, Rangpur	Paediatrics
076-7821	Dr. Zeena Salwa	Rangpur Medical College, Rangpur	Paediatrics
076-7826	Dr. Subrota Kumar Roy	Dhaka Medical College, Dhaka	Paediatrics
076-7827	Dr. Subhasish Das	MAG Osmani Medical College, Sylhet	Paediatrics
076-7831	Dr. Sabina Yasmeen	MAG Osmani Medical College, Sylhet	Paediatrics
]076-7834	Tahera Nazrin	Sir Salimullah Medical College, Dhaka	Paediatrics
076-7835	Syeda Zeenat Laila	Mymensing Medical College, Mymensing	Paediatrics
076-7850	Dr. Nitish Kumar Kundu	Sir Salimullah Medical College, Dhaka	Paediatrics
076-7870	Dr. Afroza Haque	Mymensing Medical College, Mymensing	Paediatrics
076-7873	Dr. Md Abdul Mannan	Rangpur Medical College, Rangpur	Paediatrics
076-7878	Dr. Gopen Kumar Kundu	Sir Salimullah Medical College, Dhaka	Paediatrics
076-7879	Dr. Gias Uddin Ahmed	Rajshahi Medical College, Rajshahi	Paediatrics
076-7886	Farida Khatun Chhobi	Chittagong Medical College, Chittagong	Physical Medicine & Rehabilitation
076-7887	Fatema Johora Akhand	Comilla Medical College, Comilla	Physical Medicine & Rehabilitation
076-7888	Khurshid Mahmood	Dhaka Medical College, Dhaka	Physical Medicine & Rehabilitation
076-7890	Moshiur Rahman Khasru	Mymensing Medical College, Mymensing	Physical Medicine & Rehabilitation
076-7891	Mohammad Azizur Rahman	Chittagong Medical College, Chittagong	Physical Medicine & Rehabilitation
076-7893	Md. Ariful Islam	Chittagong Medical College, Chittagong	Physical Medicine & Rehabilitation
076-7894	Md. Abu Bakar Siddiq	Chittagong Medical College, Chittagong	Physical Medicine & Rehabilitation
076-7896	Dr. Md. Ali Emran	Sir Salimullah Medical College, Dhaka	Physical Medicine & Rehabilitation
076-7897	Md Masudur Rahman	Dhaka Dental College, Dhaka	Prosthodontics
076-7898	Mohammad Shamsul Ahsan	Chittagong Medical College, Chittagong	Psychiatry
076-7900	Aurobindo Roy	Dhaka Medical College, Dhaka	Radiology & Imaging
076-7902	Nigar Sultana	MAG Osmani Medical College, Sylhet	Radiology & Imaging
076-7910	Muhammad Masudul Hassan Arup	Mymensing Medical College, Mymensing	Radiotherapy
076-7912	Dr. Chitta Ranjan Roy	Rajshahi Medical College, Rajshahi	Surgery
076-7913	Dr. Bijan Kumar Nath	Chittagong Medical College, Chittagong	Surgery
076-7927	Sayed Md Samser Nahid	Dhaka Medical College, Dhaka	Surgery
076-7938	Muhammad Jakir Hussain	Sir Salimullah Medical College, Dhaka	Surgery
076-7942	Mohd. Mejbahul Bahar	Sir Salimullah Medical College, Dhaka	Surgery
076-7949	Mohammed Abu Kawsar Sarker	Sir Salimullah Medical College, Dhaka	Surgery
076-7956	Mohammad Sahajadul Alam	Chittagong Medical College, Chittagong	Surgery
076-7966	Mina Ahmed	Chittagong Medical College, Chittagong	Surgery
076-7980	Md. Abdus Salam	Rajshahi Medical College, Rajshahi	Surgery

Roll No.	Name	From where Graduated	Subject
076-8002	Kazi Zana Alam	Community Based Medical College, Mymensing	Surgery
076-8012	Zubayer Ahmad	MAG Osmani Medical College, Sylhet	Surgery
076-8014	Tutul Talukdar	Khulna Medical College, Khulna	Surgery
076-8022	Sharmistha Roy	Dinajpur Medical College, Dinajpur	Surgery
076-8042	Dr. S.M. Shahadat Hossain	Sir Salimullah Medical College, Dhaka	Surgery
076-8060	Dr. Md.Moklasur Rahman	Rangpur Medical College, Rangpur	Surgery
076-8069	Dr. Md. Borhan Uddin Bithu	Dhaka Medical College, Dhaka	Surgery
076-8093	A. M. Rejaus Satter	Mymensing Medical College, Mymensing	Surgery
076-8101	A S M Tanjilur Rahman	Khulna Medical College, Khulna	Surgery

The following candidates Satisfied The Board Of Examiners And Are Declared To Have passed the Preli - FCPS - II Examinations held in January 2010 subject to confirmation by the council of Bangladesh College of Physicians and Surgeons

Roll No.	Name	From where Graduated	Subject
010-8226	Md Shafiul Alam	Sir Salimullah Medical College, Dhaka	Preli - Medicine
010-8235	Gazi Mohammad Imranul Haque	Jahurul Islam Medical College, Bajitpur	Preli - Paediatrics
010-8239	Kanta Chowdhury	Dhaka Medical College, Dhaka	Preli - Paediatrics
010-8240	A. N. M. Ilias	Sir Salimullah Medical College, Dhaka	Preli - Surgery
010-8241	Dr. Md.Nasir Uddin	Rangpur Medical College, Rangpur	Preli - Surgery
010-8243	Dr. Dewan Shamsul Asif	MAG Osmani Medical College, Sylhet	Preli - Surgery
010-8244	Dr. Sonjoy Biswas	Sir Salimullah Medical College, Dhaka	Preli - Surgery
010-8245	Tanveer Ahmed	Mymensing Medical College, Mymensing	Preli - Surgery
010-8246	Syed Md. Muhsin	Chittagong Medical College, Chittagong	Preli - Surgery
010-8248	Sharif Ahmed Jonayed	Sir Salimullah Medical College, Dhaka	Preli - Surgery
010-8249	Mohammad Kamruzzaman	Rajshahi Medical College, Rajshahi	Preli - Surgery
010-8251	Mohammad Arifur Rahman	Sir Salimullah Medical College, Dhaka	Preli - Surgery
010-8252	Mohammad Abdul Aziz	Bangladesh Medical College, Dhaka	Preli - Surgery
010-8256	Md. Mahbubul Alam	Shahid Ziaur Rahman Medical College, Bogra	Preli - Surgery
010-8260	Khondaker Arafuzzaman	Khulna Medical College, Khulna	Preli - Surgery
010-8262	S. M. Eqbal Hossain	Dhaka Medical College, Dhaka	Preli - Surgery
010-8264	Muhammed Alam	Mymensing Medical College, Mymensing	Preli - Surgery
010-8265	Muhammad Zia Uddin	Comilla Medical College, Comilla	Preli - Surgery
010-8272	Dr. Sanjoy Biswas	MAG Osmani Medical College, Sylhet	Preli - Surgery
010-8274	Dr. Imran Choudhury	Comilla Medical College, Comilla	Preli - Surgery
010-8275	Dr. M. A. Hamid	Dhaka Medical College, Dhaka	Preli - Surgery

The following candidates Satisfied The Board Of Examiners And Are Declared To Have passed the MCPS Examinations held in January 2010 subject to confirmation by the council of Bangladesh College of Physicians and Surgeons

Roll No.	Name	From where Graduated	Subject
076-9004	Md Waheed Murshed	Mymensing Medical College, Mymensing	Anaesthesiology
076-9014	Md Monirul Islam	Rajshahi Medical College, Rajshahi	Clinical Pathology
076-9015	Md Ishtyaq Ahmed	Armed Forces Medical College, Dhaka	Clinical Pathology
076-9016	Md Moshiur Rahman	Chittagong Medical College, Chittagong	Clinical Pathology

Roll No.	Name	From where Graduated	Subject
076-9017	Abdullah-Al-Faruq	Chittagong Medical College, Chittagong	Dental Surgery
076-9018	Md Mostafijur Rahman	Rajshahi Medical College, Rajshahi	Dental Surgery
076-9019	Nitish Krishna Das	Dhaka Dental College, Dhaka	Dental Surgery
076-9022	A K M Shahnawaz Ali Raza	Dhaka Dental College, Dhaka	Dental Surgery
076-9025	Muhammad Iftekhar Mahmud	Chittagong Medical College, Chittagong	Dermatology and Venereology
076-9026	Farhana Quyum	Z.H. Shikder Women's Medical College, Dhaka	Dermatology and Venereology
076-9043	Md. Mosharraf Hossain	Sir Salimullah Medical College, Dhaka	Medicine
076-9056	Abu Yousuf Md Shahidul Alam	Sir Salimullah Medical College, Dhaka	Medicine
076-9060	Kabir Ahmed	Chittagong Medical College, Chittagong	Medicine
076-9061	Jibesh Kumar Pramanik	Rajshahi Medical College, Rajshahi	Medicine
076-9065	Dr. Saroj Kanti Chowdhury	Chittagong Medical College, Chittagong	Medicine
076-9074	Dr. Mohammad Ashraful Kabir	Dhaka Medical College, Dhaka	Medicine
076-9080	Dr. Harimohan Pandit	Mymensing Medical College, Mymensing	Medicine
076-9086	Bolai Chondro Sarker	Dhaka Medical College, Dhaka	Medicine
076-9087	Kamruzzaman Md Zahir	Chittagong Medical College, Chittagong	Medicine
076-9092	Md Amir Hossain	Sir Salimullah Medical College, Dhaka	Medicine
076-9095	Dr. Mohammad Sofiul Kadir	Chittagong Medical College, Chittagong	Medicine
076-9099	Bishnu Pada Das	Sher-E-Bangla Medical College, Barisal	Medicine
076-9108	Mohammad Mosharof Hossain	Faridpur Medical College, Faridpur	Medicine
076-9110	Syed Mohammad Ali Romel	Chittagong Medical College, Chittagong	Medicine
076-9131	Shanjida Kabir	Chittagong Medical College, Chittagong	Obst and Gynae
076-9133	Kausar Parvin	Institute of Applied Health Science, under USTC, Chittagong	Obst and Gynae
076-9136	Fauzia Sultana	Rajshahi Medical College, Rajshahi	Obst and Gynae
076-9140	Rowshan Akter	Bangladesh Medical College, Dhaka	Obst and Gynae
076-9146	Mst. Sultana Akhtar Banu	Khulna Medical College, Khulna	Obst and Gynae
076-9150	Zebun Nessa	Sher-E-Bangla Medical College, Barisal	Obst and Gynae
076-9151	Nafisa Jafreen	Mag Osmani Medical College, Sylhet	Obst and Gynae
076-9177	Kamrun Nahar	Rangpur Medical College	Obst and Gynae
076-9178	Lipi Paul	Dhaka Medical College, Dhaka	Obst and Gynae
076-9201	Sabina Parveen	Rajshahi Medical College, Rajshahi	Obst and Gynae
076-9219	Paritush Kanti Talukder	Chittagong Medical College, Chittagong	Ophthalmology
076-9221	Mohammad Ahmed Mustafa Hossain	Jahurul Islam Medical College, Bajitpur	Ophthalmology
076-9223	Shaila Rahman	Medical College for Women and Hospital, Dhaka	Ophthalmology
076-9226	Dr. Nandan Kushum Das	Community Based Medical College, Mymensing	Ophthalmology
076-9237	Dr. Md.Alamgir Hossain	Comilla Medical College, Comilla	Otolaryngology
076-9240	Mohammed Iftekharul Alam	Jahurul Islam Medical College, Bajitpur	Otolaryngology
076-9248	Jannatul-Ferdous	Sher-E-Bangla Medical College, Barisal	Paediatrics
076-9264	Mohammed Maruf-Ul-Quader	Jahurul Islam Medical College, Bajitpur	Paediatrics
076-9265	Ayesha Hasina	Shahid Ziaur Rahman Medical College, Bogra	Paediatrics
076-9266	Samiha Amin	Chittagong Medical College, Chittagong	Paediatrics
076-9277	Ashis Kumar Halder	Sher-E-Bangla Medical College, Barisal	Paediatrics
076-9282	Mohammad Tariqul Alam	Sher-E-Bangla Medical College, Barisal	Psychiatry

Roll No.	Name	From where Graduated	Subject
076-9287	Tasmin Kabir	Sher-E-Bangla Medical College, Barisal	Radiology & Imaging
076-9288	Asma Siddiqua	MAG Osmani Medical College, Sylhet	Radiotherapy
076-9291	Md. Abu Rayhan Bhuiyan	Rajshahi Medical College, Rajshahi	Surgery
076-9293	Md. Abdul Hadi	Rangpur Medical College, Rangpur	Surgery
076-9295	Molla Sharfuddin Ahmad	Sher-E-Bangla Medical College, Barisal	Surgery
076-9302	Dr. . Mohammad Abu Hanif		Surgery
076-9321	Mohammad Zakir Hossain Bhuiyan	Dhaka Medical College, Dhaka	Surgery
076-9323	Md Asaduzzaman	Rajshahi Medical College, Rajshahi	Surgery
076-9336	Md Saifullah Kabir	Dhaka Medical College, Dhaka	Surgery

CONTINUING PROFESSIONAL DEVELOPMENT (CPD) PROGRAMME

The concept of Continuing Professional Development (CPD) is emerging day by day. It is a multi professional activity which refers to an educational activity that helps professional to keep their knowledge and skills up to date in response to the changing demands of the society and of their professions. This Continuing education takes place after full term formal undergraduate and post graduate course.

BCPS has been organizing the CPD Programme for last few years but the programme was not proved to be effective. To improve the quality, we received feedback from fellows on how to improve it through a questionnaire. Among many suggestions, CPD committee has accepted two. One in decentralization of the monthly programme, another is organization of CPD day once or twice in a year.

Accordingly, we have arranged a CPD programme at Dhaka Medical College in April 2010 and the programme will be arranged at other institutions also in future.

We also have organized a CPD Day at BCPS premises. It was a day long programme from 8.30-4.00 p.m. 473 doctors including past and present president of BCPS councilors, fellows working at different place of Bangladesh and post graduate students of different specialties participated in the programme. A total of 34 (thirty four) papers were presented in the scientific session. The inaugural session was chaired by the President of the College Prof. Nazmun Nahar, Honorary Secretary of the BCPS Prof. Kanak Kanti Barua, Chairman CPD Committee Prof. Md. Azizul Kahhar & Member Secretary CPD Committee Prof. Tahmina Begum spoke on the occasion.

We hope to continue this program in future & make the programme more effective.

Prof. Tahmina Begum
Member Secretary
CPD Committee

FROM THE DESK OF THE EDITOR in CHIEF

(J Bangladesh Coll Phys Surg 2010; 28: 140)

In the meeting of the board of editors chaired by Professor AKM Mahbubur Rahman a decisions had been taken that a core group personal (Senior Fellows) will correct and edit all the articles after peer reviewed.

Already we have started some new section like; "letter to the editor", "short communication" from our last issue. From this issue fellows are requested to submit articles on another two new section like; "Images in medical practice" and "Medical controversies". Already we have got good response from home and abroad.

We have also got tremendous support from abroad. We are trying to disseminate the journal to many different web sites and data bases. Already the journal is enlisted in the following data bases (BanglaJOL, AsiaJOL, Google Scholar, DOAJ, Index Copernicus). We have applied for enlistment in the following (HINARI, SCOPUS, Bioline International, ProQuest, Elsevier databases: EMBASE, EMcare, Compendex, EnCompassLIT, GEOBASE) and they have responded positively.

A new email address for BCPS has been activated: bcps@bcps_bd.org. Now authors can communicate and submit their article on journal email: journal.bcps@gmail.com. Hope to give more new information and further development in the coming days. Best wishes for all the fellows.

Prof. Quazi Tarikul Islam
Editor-in-Chief

NAME OF THE REVIEWER OF ARTICLES IN THIS ISSUE

(J Bangladesh Coll Phys Surg 2010; 28: 141)

Professor Farhana Dewan & Md. Shafiqual Islam

Professor Azharul Hoque & Professor Firoz Ahmed Quraishi

Professor Maliha Rashid & Professor Farhana Dewan

Professor M.F. Kabir & Professor (Col) Enamul Hoque Chowdhury

Prof. Md. Zillur Rahman & Dr. Md. Shahdat Hossain

Dr. Md. Nazrul Islam Siddique

Professor M.A. Masud & Professor Shapawn Chandra Dhar

Professor Sakhawat Hossain & Professor Abidul Haque

Professor Lutfar Rahman & Professor Syed Azizul Haque

Obituary

The following Fellows who died between January to May 2010.

Professor Kazi Shamsul Haque

Professor Kazi Shamsul Haque was first the president of BCPS during 1972 to 1975. He died on 23 February, 2010 at the age of 99 due to ageing. He was awarded fellowship without examination in Radiology in 1972. He was the founder fellow of BCPS.

Lt. Col.Dr. Fatema Akhter

Lt. Col .Dr.Fatema Akhter (Fellow No. 2414) died on 21 March, 2010.She passed fellowship examination in Orthodontics Orthopaedics in July ,2008 from Bangladesh College of Physicians and Surgeons (BCPS).Before her death, she was service at Combined Military Hospital(CMH),Dhaka cantt.,Dhaka.