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JOURNAL OF BANGLADESH COLLEGE OF PHYSICIANS AND SURGEONS

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EDITORIAL

Osteoporosis : A Silent Epidemic in Women

Osteoporosis is a condition where there is a reduction in the bone mass and microarchitectural deteriotration of bone tissue which reduces the physical strength of the bone and leads to increased susceptibility to fracture. Osteoporotic fracture causes considerable increase in morbidity and public health cost. Women are more prone to loss of bone mass at climacteric. The increased loss of bone mass begins at premenopause which become worse at menopause[1-7]. In childhood and adolescence the bone mass increases rapidly. The peak level is reached at 30 to 35 years of age and sharp decline of bone mass occurs after 45 years[8].

Among the many causes of osteoporosis the commonest cause is the menopause. The increased bone loss is due to declining ovarian function associated with oestrogen deficiency at menopause and after oophorectomy[9-12].

The osteoporotic fractures mainly affect the wrist, spine and hip. Hip fracture mainly affects the elderly women and is the reason for high bed occupancy in many countries. Wrist fracture are very common among European women and the peak incidence is after five years of menopause.

There are many factors besides menopause contributing to osteoporosis in women. Body resume state, genetic disposition and nutrition can play a significant role in bone mineral acquisition[13-15]. Physical activities help in accumulation of bone mass and reinforces the trabecular strength[16].

The other risk factors for osteoporosis are smoking, abuse of alcohol, sedentary working habits and low calcium containing diets.

For the diagnosis of osteoporosis, numerous methods are now available to measure the bone mass density (BMD). Single photon absorptiometry (SPA) that is applied for BMD measurements at the appendicular skeleton has proved to be a valuable tool for the diagnosis of osteoporosis which provides reasonable and low radiation exposure. More recently developed devices are the use of an X-ray tube (SXA) rather than radionuclide, resulting in improved precision and cost-effectiveness for the system. Dual X-ray absorptiometry (DXA) also allows for BMD measurements at sites with inconstant soft tissue thickness e.g. lumber spine and hip, and has reached great acceptance in clinical management and research. Quantitative ultrasound and magnetic resonance imaging are new techniques that are currently under investigation.

Osteoporosis is an age related disorder in women where accelerated bone mass loss is observed in post-menopausal women. For the prevention of osteoporosis early diagnosis and adequate dose at oestrogen therapy is important. Both prospective and retrospective studies clearly demonstrated that oestrogen therapy reduces the incidence of osteoporotic fracture. This oestrogen thereapy is also protective against heart disease and provides a longer life expectancy and also possibly protects against endometrial cancer when cycled with progestins[16-20].

The role of calcium containing diet in the prevention of bone loss has been documented. Post-menopausal women who are most likely to benefit from calcium supplements are those whose usual dietary calcium intake is low[21]. Sowers in 1993 showed that moderate physical exercise in women optimizes the premenopausal bone density within genetic potential[22].

So to prevent osteoporosis in women, in addition to estrogen replenishment therapy, calcium containing diet and moderate physical exercise should be advised which will help to improve the quality of life in post-menopausal women by reducing the risk of osteoporotic freacture.

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(J Bangladesh Coll Phys Surg 1997; 15 : 1-2)

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Clinical Risk Factors for Preterm Births

F BEGUM, FCPS[a], TA CHOWDHURY, FRCS[b]

Summary :

A prospective study on clinical risk factors for preterm births was done in the Department of Obstetrics and Gynaecology, Sir Salimullah Medical College and Mitford Hospital, Dhaka between first June 1993 and 31st March 1994. Study population consisted of 3,696 births including 211 preterm interruptions of pregnancy (5.71%). Important clinical risk factors were eclampsia, preeclampsia, preterm premature rupture of membrane (PROM), placenta praevia, multiple pregnancy, urinary tract infection, congenital anomaly of foetus, hepatitis and asymptomatic bacteriuria.

(J Bangladesh Coll Phys Surg 1997; 15 : 3-10)

Introduction :

The importance of preterm births as a major obstetric and public health problem is easily demonstrated because of its contribution to total perinatal mortality (contributing between 50% and 70% of all perinatal deaths in most data sets)[1].

The definition of preterm infant is an infant born prior to 37 weeks (less than 259 days), counting from the first day of last menstrual period[1]. On the other hand, birth weights of 2,500 gm and under had been arbitrarily accepted for the purpose of classifying births as premature[2]. But now WHO has recommended to replace the term "prematurity" in preference to "low birth weight" (one whose birth weight is less than 2,500 gm irrespective of the gestational age)[3].

Hoffman and Bakketeig[4] had shown that race, multiple births, previous history of preterm birth and late second trimester abortion, young and old maternal age, lower educational attainments, clerical, sales and manufacturing jobs, psychological stress, physical stress, alcohol consumption etc. increases the risk of preterm births[4]. Preterm premature rupture of membrane (PROM) is a cause of preterm birth. In about 2% of pregnancies before 37 weeks PROM occurs. Maternal genital tract infection, young age, low socio-economic status, coital frequency and chorioamnionitis increases the incidence of both PROM and preterm delivery[5]. Theoretically, there is good reason to suggest that infection can initiate preterm birth. Bejar and co-workers have found that micro-organisms commonly associated with prematurity and perinatal infections possess phospholipidase A_2 activities several times higher than that of membarane phospholipidase A_2[6]. Maternal smoking alters blood levels of certain nutrients and possibly aggravates poor nutritional status. In any event, an association is seen between PROM and smoking. Mayer and Tonascia confirmed the above[7]. Rayburn and Wilson found that patients with PROM had a 50% higher incidence of coitus in the week preceding delivery than the controls[8]. Cervical incompetence, whether congenital or acquired secondary to cervical injury, can be responsible for preterm labour. Preterm termination of pregnancy due to rupture of the membranes in patients with an incompetent cervix is also sometimes the inadvertent consequence of attempts to manage this condition by placement of a cervical cerclage[9,10].

The study of risk factors for preterm birth is essential starting point for the planning and development of intervention studies for improving the organization of obstetric care to reduce the number of preterm deliveries and the associated high rates of mortality and

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morbidity. This study was done with the objective that it would be helpful in reducing the perinatal mortality and prevention of preterm births. In this study, a sample of patients with preterm termination of pregnancy were closely supervised on selected parameters to understand the clinical risk factors associated with preterm births.

Materials and method :

A prospective study on clinical risk factors for preterm births was done in the Department of Obstetrics and Gynaecology of Sir Salimullah Medical College and Mitford Hospital, Dhaka. Data was collected from first June 1993 to 31st March 1994. All preterm births (pregnancies between 29th and 37th weeks i.e. 197th and 259th day) were included. The lower limit of gestation was taken as 28 weeks because the perinatal mortality below this cut off point was very high for lack of intensive neonatal care facilities. Consecutive admissions with preterm termination of pregnancy (both spontaneous and elective) were included. After taking relevant history, clinical examination was done and samples for investigations were collected. Preterm labour were diagnosed on the basis of (i) regular recurrent uterine contraction (at least once in 10 minutes and lasting for 30 seconds or more) and (ii) progressive dilatation and effacement of the cervix. Induction of labour was done by any or combination of following : oxytocin drip (5 units in 500 ml of 5% dextrose in aqua); artificial rupture of membranes; and introduction of Foley's catheter balloon through the cervix. Maternal and foetal monitoring in labour was done in the standard way.

Results :

During the period of data collection 3,696 patients were admitted for delivery in the Department of Obstetrics and Gynaecology of Sir Salimullah Medical College and Mitford Hospital, Dhaka. Out of them, there were 211 (5.70%) cases of preterm termination of pregnancy (Table-I). One hundred and forty-six (3.95%) were spontaneous preterm labour. Preterm, premature rupture of the membranes (PROM) were found in 25 (0.68%) cases. There were 50 (1.35%) twins and three (0.08%) triplets among the total patients. Two patients died of hepatic coma, undelivered. Total number of babies were 3,750. Among singleton pregnancies (3,643), 193 were preterm termination of pregnancy (5.29%), whereas in twin pregnancies, 15 were preterm (30%). Therefore, twin pregnancies had about six fold risk to be ended prematurely. All the triplets (3) delivered prematurely (100%).

Amongst 211 preterm termination of pregnancy, there were 209 deliveries. In 146 (69.19%) patients there were spontaneous labour. Elective termination of pregnancy was done in 65 (30.81%) cases.

Table-II shows the clinical conditions which were found to be the risk factors in preterm births. Eclampsia, pre-eclampsia, preterm premature rupture of membrane, cervical infections, placenta praevia, multiple pregnancy, urinary tract infection (UTI), congenital anomaly, jaundice (hepatitis) and

Table-I

Total births and preterm births in the study period

	Total	Total preterm	Total singleton	Preterm singleton	Total multiple	Preterm multiple
Births	3,996	211	3,641+2*	191+2*	53	18
Babies	3,750	230	3,641	191	109	39

*Died undelivered

Table-II

Clinical conditions as risk factors for 211 preterm births and their mean gestational age at delivery

Sl. No.	Type	Clinical complication		Mean gestational weeks at delivery
		Number	Percent	
1.	Unknown	31	14.60	33.30±2.50
2.	Eclampsia	30	14.21	33.30±2.90
3.	PET	25	11.84	34.04±2.20
4.	PROM	20	09.47	33.30±2.34
5.	Placenta praevia	18	08.53	32.33±2.44
6.	Twin pregnancy	15	07.10	34.33±2.31
7.	UTI	13	06.16	32.07±2.56
8.	Congenital anomaly	10	04.73	34.10±2.42
9.	Jaundice (Hepatitis)	09	04.26	32.22±3.34
10.	Asymptomatic bacteriuria	09	04.26	33.88±1.96
11.	RTI	06	02.84	32.84±1.94
12.	Severe anaemia	06	02.84	32.10±2.92
13.	Hydramnios	04	01.89	30.50±10
14.	Triplet pregnancy	03	01.42	34.00± 2.64
15.	Abruptio placentae	02	00.94	34
16.	Cervical incompetence	01	00.47	28
17.	Diarrhoea	01	00.47	34
18.	Syphilis	01	00.47	28
19.	Left ventricular failure	01	00.47	34
20.	Diabetes mellitus	01	00.47	36
21.	Placenta percreta	01	00.47	30
22.	Septate uterus	01	00.47	32
23.	Fibroid uterus	01	00.47	31
24.	Subacute intestinal obstruction	01	00.47	34
25.	Ruptured uterus	01	00.47	32
	Total	211	100	

asymptomatic bacteriuria were found to be the major risk factors. Thirty two patients were listed as undetermined where no cause was apparent. PROM was the sole associated cause of preterm birth in 20 cases. In another five cases, in addition to PROM, there were other associated factors such as preeclamptic toxamia (PET) (2), twin (1), congenital anomaly (1) and jaundice (1).

Hydramnios was found in seven cases of preterm births and was associated with anencephaly (1), hydrocephalus (1) and twin (1). Incidence of PET was 11.84% (25 cases). There were two other PET cases: one associated with placenta praevia and the other with twin pregnancy. Diabetes mellitus was also found in two cases : one was associated with type IV placenta praevia. *Abruptio placentae* was found only in two cases. An extremely rare clinical condition - 'placenta percreta' was found in one case and should not be taken as a common risk factor of preterm births. Gross congenital anomaly was found in 10 cases and of them only one baby survived. Anencephaly was found in five (50%) cases (Table-III). Fifty five patients gave history of

Table-III

Congenital anomalies found among preterm births

Congenital anomaly	Number.	Weeks of gestation (Number)	Foetal outcome			
			Alive	IUD	SB	NND
Anencephaly	05	28 (1) 33 (2) 35 (2)	00	01	01	03
Hydrocephalus	01	36	00	01	00	00
Phocomelia	01	36	00	01	00	00
Imperforate anus	01	34	01	00	00	00
Absence of one ear	01	35	00	00	00	01
Spina bifida	01	36	00	00	01	00
Total	10		01	03	02	04

some sort of psychological stress e.g. hearing bad news, fear of death during delivery, tension about complication of present pregnancy such as, vaginal bleeding, swelling of feet, fear of delivering a dead or premature baby again (in patients with history of stillbirth and premature births), anxiety for financial reasons etc. In 12 patients there were history of physical stress e.g. long journey, fall, abdominal massage and other forms of trauma. Breech presentation was found in 15 cases (7.11%) and transverse lie was found in seven cases (3.32%), the rest 189 (89.57%) were cephalic presentations.

Haemoglobin level below 45% (<6.50 gm%, severe anaemia) was found in 30% of the patients with preterm deliveries; between 45% and 55% (6.50-8gm%, moderate anaemia) in 33% patients; and between 55% and 68% (8-10 gm%, mild anaemia) in 34% patients. The findings depicted that about 95% of the patients were anaemic with 62% having haemoglobin below 60%. The serum urea level was within normal range in all patients, except a patient with eclampsia where the level was 60 mg/dl. The condition improved later.

Table-IV shows the reports of urine culture. There were 13 preterm births where UTI seemed to be the direct cause. In addition, there were 10 cases of UTI associated with other conditions, giving an overall incidence of 10.90%. Asymptomatic bacteriuria seemed to be sole associated condition in nine preterm births. There were 24 more cases of asymptomatic bacteriuria associated with other risk factors giving total of 33 cases of asymptomatic bacteriuria (15.60%). In almost all cases the causative organism was *E. coli* with exception of one *pseudomonas* and one *klebsiella* infection.

Table-IV

Result of urinary culture in patients with preterm births

Associated clinical conditions	Organism	Preterm births	
		Number	Percent
UTI	E. coli	21	
	Pseudomonas	1	10.90
	Klebsiella	1	
Asymptomatic bacteriuria	E. coli	33	15.60

Table-V

Clinical risk factors of preterm births as found by Wahed in IPGM&R[16]

Causes of preterm deliveries	Number	Percent
Toxaemia of pregnancy	31	31.30
Multiple pregnancy	10	10.10
Antepartum haemorrhage	08	08.08
Multiparity	03	03.03
Young mother (18 years)	03	03.03
Diabetes mellitus	03	03.03
History of fall	02	02.02
Habitual abortion	01	01.01
Chronic renal failure	01	01.01
Rh incompatibility	01	01.01
Unknown	36	36.18
Total	99	100

Discussion :

Prematurity ranks as the major cause of neonatal morbidity and mortality. About 6% of deliveries occur before this time in UK[11]. The prevalence widely varies from country to country and ranges between five and 10%[12]. The incidence of 5.70% noted in this study falls within the above mentioned range.

Kramer has done a meta-analysis of 895 available publications on low birth weight in 1987[13]. He found many discrepancies and commented "Perhaps the most important reason for the discrepant findings has been the failure to distinguish markers or associated factors from true causal determinants. Many of the potential determinants are highly associated and their effects are thus mutually confounded. Failure to control for confounding variables can lead to erroneous association between a factor and intrauterine growth retardation (IUGR) and prematurity"[13].

Arias and Tomich in their study of 355 live born infants weighing between 600-2500 gm reported the following causes of preterm birth: prematurely ruptured membranes (35%), preterm labour (30%) and other maternal foetal complication (35%). The later included multi-foetal pregnancy, hypertensive disorders, congenital malformations, placental abruption and placenta praevia[14]. Amon and colleagues found that only 25.5% presented with uncomplicated preterm labour, while 30.8% were associated with premature rupture of the membranes and 20.3% with antepartum haemorrhage. Severe preeclampsia/eclampsia (13.7%) and incompetent cervix (9%) was also found to be important causes[15].

Wahed found 99 preterm babies out of 500 neonates in a tertiary care hospital in Bangladesh[16]. Clinical risk factors of prematurity in his series were shown in Table -V. Another study in the same institution reported more or less similar risk factors for preterm births[17]. Romero et al reported that in their series, among preterm births, the proportion of patients presented with preterm labour, preterm PROM or medical complication were one third each[18].

Eclampsia leads to both high prematurity and perinatal death. Ali in a study in Bangladesh found that toxaemia was the cause of prematurity in 12% cases[19]. Pre-eclampsia is one of the chief causes of preterm births

(36%)[2]. It is to be noted that PET is a cause of prematurity more because of the need to terminate pregnancy early than due to its own direct effects on the woman. Though, sometimes, it may kill the baby in utero, thus causing the premature birth of a macerated foetus.

Preterm premature rupture of the membranes is reported to occur in about 1/3rd cases of preterm births[18]. Preterm PROM is more important than uncomplicated preterm labour as an immediate precipitating event of preterm birth. The incidence of preterm PROM was 2.3% of all pregnancies in San Francisco over 10 years period and PROM was found in 28.4% of all preterm deliveries (8.2%)[20].

Placenta praevia may cause preterm births either spontaneously or due to preterm termination. In one series it resulted in 12% of preterm births. About 30% of the twin pregnancies terminate in premature labour, which is consistent with the finding of this series. Overdistension of uterus, hydramnios and premature rupture of the membranes are responsible for preterm labour in such cases. Multiple pregnancy was found as risk factor for prematurity in Bangladesh by Wahed (10%)[16] and Ali (42%)[19].

Foetal abnormalities may cause preterm spontaneous interruption of pregnancy or if diagnosed may call for early induction. The incidence of significant congenital malformation is about 2-5% at birth[12]. Defect in central nerovus system constitute about 50%. In developed countries, however, major foetal abnormalities account for about 20% of perinatal death[11]. In the present series, congenital anomaly was the cause of preterm delivery in about 5% of the cases; all had spontaneous onset of labour.

Viral hepatitis is the commonest cause (about 40%) of jaundice in pregnancy[12]. Hepatitis is mostly restricted to the ill nourished mothers living in unhygienic environment. Both maternal and foetal outcome are poor in these cases. There is increased incidence of postpartum haemorrhage, hepatic coma and other haemorrhagic manifestations. All these lead to increased maternal and foetal morbidity and mortality. There is increased incidence of abortion, premature labour and intrauterine death leading to increased foetal wastage[12]. In the present series, nine cases were associated with viral hepatitis.

Respiratory tract infection like other systemic infections can affect gestational duration through any of these mechanisms : firstly, the metabolic cost of high temperature or of mounting appropriate host defenses may reduce the energy available to the foetus, even with a constant dietary caloric intake. The infection can also lead to diminished uterine blood flow or can spread to the placenta or amniotic fluid and hence precipitate premature delivery. Any serious illness, specially those producing very high temperature e.g. pyelitis and pneumonia, can also bring in labour and it is important to control hyperpyrexia for this as well as for other reasons[13]. Premature labour, either spontaneous or induced, and PROM are common secuelae of hydramnios. Congenital foetal malformation is associated with hydramnios in about 20% cases[11].

Abruptio placentae, which may be a manifestation of toxaemia was also found to be a risk factor in two cases. Diarrhoea and irritation of bowel may reflexly stimulate uterine contraction, leading to preterm labour[12]. Syphilis, always quoted as a cause, particularly of premature still birth is less common now a days, in fact, is far less than 1% of cases, thanks mainly to routine diagnosis in early pregnancy and availability of modern treatment[2].

Abnormal cervical function or cervical incompetence during pregnancy may result in pregnancy loss or premature births. The diagnosis of cervical incompetence is difficult to make. Cervical changes suggesting incompetence certainly may be detected by digital examination. Unfortunately, the changes may occur rapidly and may be

advanced at the time of presentation. However, even cervical changes detected either digitally or by ultrasound may not be accurate. The changes may be a result of a process entirely different from cervical incompetence. The most widely accepted method of making the diagnosis of cervical incompetence is careful review of the patent's history and clinical evaluation. The true rate of incidence of cervical incompetence is not known, and the benefit of various treatment modalities has not been adequately evaluated to date and has been brought into question. Cervical incompetence or rather an undue readiness of the cervix to dilate may be a factor and justify the insertion of Shirodker's type of stitch[2]. Severe cardiac lesion predisposes to premature labour[2]. Fibroids are often unpredicted in their effect on pregnancy but in as much as they may provoke abortion, so too they may provide premature labour. The effect, however, can only be regarded as mechanical when the mass of fibroid is exceptionally large, and in the average case, endocrine factors are probably at work. Surgical conditions e.g. acute appendicitis, and abdominal operations e.g. appendicectomy, myomectomy may precipitate premature labour. The case reported in the present series is a case of subacute intestinal obstruction and though thought to be full term pregnancy (calculated from LMP), ultimately revealed a preterm baby on caesarean section.

Preterm labour is nearly twice as common among diabetic mothers as in general hosiptal population[21]. Congenital anomaly of the uterus in premature labour is a uncommon finding. The greater the degree of reduplication of the uterus e.g. the more extensive the septum and the more complete the separation of the uterus in two distinct halves, the greater the risk of premature labour. Bicornuate, unicornuate and subseptate uterus provoke preterm labour probably due to ineffective placentation which causes placental insufficiency or by a reduced capacity of the uterus. Placenta percreta is an extremely rare condition. It occurs in about 5% cases of abnormally adherent placenta[22]. The case reported here presented with spontaneous rupture of gravid uterus through fundus by invading placental villi. Psychological shock can bring in labour any time in patients whose hold on pregnancy is none to secure[2]. Ian Donald stated that bacteriuria was found in 4.6 to 11% pregnant women, of those 16% developed clinical UTI as against 4% incidence of the whole hospital[2]. Incidence of prematurity is strikingly increased to 13.3% in cases of bacteriuria as against only 5% of those with clear urine. Despite many studies, relationship between asymptomatic bacteriuria and preterm delivery/low birth weight (LBW) has remained controversial. Asymptomatic bacteriuria occurred in three to 10 percent of all pregnant women, and if untreated 30 to 50% of these women will develop pyelonephritis[19]. Meta-analysis of the results of studies yielded a significant difference in the rate of preterm delivery in favour of non-bacteriuria patients[13]. One case control study suggested that the incidence of asymptomatic bacteriuria was significantly greater in the group delivering before 36 weeks (8.1%) than in matched control group delivering after 36 weeks (3.7%)[20]. In conclusion it was stated that the incidence of prematurity/LBW was higher in women with asymptomatic than in nonbacteriuric women. Furthermore, treatment of asymptomatic bacteriuria with antibiotics resulted in reduction of the rate of preterm/LBW. Current information, however, suggests that urinary tract infection is probably not a major determinant of IUGR or gestational duration, at least in developing countries. Nevertheless, in developed countries, both the effect and prevalence of gestational UTI merit increased attention.

The association between prolonged rupture of membranes and chorioamnionitis is well established. Evidence that these organisms can cause ruptured membrane would require documentation of membrane or amniotic fluid infection prior to rupture or proof that women

harbouring a certain organism in their vagina or cervix earlier in their pregnancy, were at a greater risk for subsequent membrane rupture and premature labour. This is particularly important for prematurity, because a threatened premature delivery is often treated with tocolytics to delay delivery as long as possible and hence maximize foetal maturity. Considerable evidence links infection and prematurity. Amniotic fluid infection syndrome was found to be the major cause of perinatal mortality in the large US collaborative study[23]. In New Haven, Connecticut, Romero et al found that 22% of women in preterm labour with intact membranes had positive amniotic fluid cultures. Fifty-five percent of those with premature rupture of membranes had positive cultures[18].

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Obstetric Outcome in Diabetic Pregnancy

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Summary :

A total of 52 patients, 31 ((59.62%) gestational (GDM) and 21 (40.38%) known diabetic (DM) in pregnancy were studied between January 1991 and October 1993 in the Institute of Postgraduate Medicine and Research (IPGM&R), Dhaka to determine the maternal and neonatal complications. Both groups had risk factors in previous pregnancies. The most common complication in present pregnancy was toxaemia which was prevalent in 19.35% in GDM group and 19.05% in DM group. Next common was hydramnios, 9.68% in GDM and 4.76% in DM group.

About one third, that is 33.26% patients in GDM and 33.34% patients in DM group delivered vaginally, rest by caesarean section. Mean birth weight of the babies were 3.16±0.5 kg and 3.0±0.55 kg in GDM and DM group respectively. Two perinatal deaths occurred in the study group. Perinatal morbidity included prematurity, foetal macrosomia, hyperbilirubinaemia, RDS and congenital foetal defect.

In both groups. diabetes was controlled either by diet alone or diet with insulin. When compared, no significant difference was found between the two groups in any parameter (P>.05). These observations indicate that there is no difference in obstetric outcome between GDM and DM if good control of diabetes is done.

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Introduction :

Diabetes in pregnancy whether it is diagnosed during current pregnancy or antedates pregnancy represents a therapeutic challenge facing the obstetricians. physicians, dieticians and neonatologists because of the long term effect it produces on the health of the mother[1-3] and the consequences to the foetus and newborn[4-10]. In the pre-insulin era, few diabetic women lived to the reproductive age and even if they did, the result of pregnancy was disastrous with a maternal mortality as high as 50% and perinatal mortality as high as 60%[11-13]. With the improvement in the management of diabetes and its complications, maternal mortality has now become a rare occurrence and perinatal mortality in well controlled patient has fallen almost identical to nondiabetic population[14-15]. But there still remains an unacceptably high rate of abortions, and life born infants often had congenital defects and metabolic problems[16,17].

Women with pregestational (overt) diabetes, compared to general population, are three or four times more likely to have offsprings with major congenital defect. This rate increases to 20-25% if the women have very poor glycaemic control during the early weeks of gestation i.e. during organogenesis[17-20]. Emphasis is now being given on pre-pregnancy control of diabetes or planned pregnancy for known cases and screening of all women in pregnancty for early detection of glucose intolerance.

The objective of this study is to determine the maternal complications and perinatal outcome in gestational and overt diabetes and to see whether there is any difference between the two groups in the perspective of Bangladesh.

Materials and method :

The study population consisted of 52 pregnant patients with glucose intolerance who were observed in one unit in Gynaecology and Obstetric department in the Institute of Postgraduate Medicine and Research (IPGM&R), Dhaka. The study period was between January 1991 and October 1993. During the antenatal period the patients were managed in joint collaboration with the Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM), Dhaka. All

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women in the study were recruited and treated according to a set protocol. Patient selection for gestational diabetes and diabetes mellitus was done according to WHO criteria[21,22]. Two groups were i) gestational diabetes (GDM) where diabetes was diagnosed for the first time during the current pregnancy; and ii) known case of diabetes mellitus (DM) with pregnancy. The two groups were compared as regards age, parity, risk factors, complications during pregnancy, time and mode of delivery, perinatal morbidity and mortality. Chi-square test was done where applicable.

The known diabetics as well as gestational diabetics after diagnosis were seen at fortnightly intervals during the first 24 weeks of gestation and thereafter weekly till delivery. Diabetic management was done by giving insulin and diet control or only diet control whatever was needed. The insulin used was short and intermediate acting highly purified insulin or human insulin. Diet adjustment was done by dietician. Metabolic control of diabetes was assessed by estimation of fasting and post-prandial venous glucose level at each visit. Patients were considered well controlled if their fasting venous plasma glucose level was between 4.5 and 5.5 mmol/dl (80-100 mg%) and a two hours post-prandial level between 5.6 and 6.7 mmol/dl (100-120 mg%) in more than 90% of visits, otherwise metabolic control was considered poor.

Intrauterine growth was assessed by frequent ultrasound examination. Uncomplicated gestational diabetics were allowed to go into spontaneous labour. In overt cases, whenever assessment of foetal well being and maturity indicated best outcome, pregnancy was terminated usually at the end of 38 weeks. Early termination was planned in poorly controlled cases or wherever assessment showed foetal jeopardy. With the aim to vaginal delivery, inductions were done by intravenous oxytocin drip and forewater amniotomy. Before induction, cervical scoring was done. Where vaginal delivery was contraindicated for obstetric reason or cervical scores were less than six, elective caesarean section was done.

On the day of induction, a fasting blood sample was taken and patient was allowed her usual breakfast and morning dose of insulin. Induction was started early in the morning with the infusion of five units of syntocinon in 500 ml of 5% dextrose in aqua. Close observation of maternal and foetal condition was done. In the postpartum period, if the patient delivered vaginally, insulin was withhold unless her blood glucose was unacceptably high in the antepartum period or she was an insulin dependant diabetic prior to pregnancy.

Patients in whom caesarean section was decided upon were kept fasting and no insulin was given in the morning. After taking a fasting blood sample, infusion of 5% dextrose in aqua was started with neutralising dose of insulin. Post-operatively, soluble insulin was given in a sliding scale according to the colour of the urine as follows : blue and green - no isulin, yellow - four units, orange - eight units, red -12 units and brick red - 16 units.

On delivery of the baby, a cord blood sample was taken for blood glucose estimation and early feeding was started to avoid hypoglycaemia. All neonates were sent to the paediatric neonatology department to exclude any abnormality.

Results :

During the 34 months of study, a total of 52 patients were studied of whom 31 (59.62%) were gestational diabetics and 21 (40.38%) were known diabetics. Amongst the known group, three (5.77%) were insulin dependent (Type I diabetic) and 18 (34.62%) were non-insulin dependent (Type II diabetic). The main clinical characteristics of the patients are shown in Table-I.

Table-I

Clinical characteristics of women with diabetes and pregnancy

	GDM (n-31)	DM (n-21)	p Value
Age (years)	30.00±5.6	28.80±6.0	0.5 NS
Parity (X ±SD)	01.90±2.0	02.60±2.3	>0.5 NS
Primigravida [No. (%)]	06 (19.35%)	02 (9.52%)	0.45 NS
Multigravida [No. (%)]	25 (80.65%)	19 (90.48%)	0.45 NS

NS = Not significant

The mean maternal age was 30.00±5.6 years in the GDM group and 28.80 ±6 years in the DM group, and mean parity was 1.90 ±2 in GDM group and 2.60 ±2.3 in DM group.

Six (19.35%) gestational diabetics and two (9.52%) overt diabetics were primigravida. Four patients (12.90%) in the GDM group and eight (15.38%) in the DM group were grand multipara (who delivered > 5 viable foetuses). There were strong family history of diabetes in both groups- (48.39%) cases in GDM group and 57.14% in DM group. When compared, no significant difference was found between the groups in age or parity distribution, or family history (p >.05).

The mode of control of diabetic status is shown in Table-II. Six patients (19.35%) in GDM group and four (19.05%) in DM group were controlled by diet only. Twenty five patients (80.65%) in the GDM group required diet + insulin, of whom 17 (54.84%) were given soluble insulin and rest soluble +intermediate insulin. In the DM group, 17 (80.96%) patients needed insulin, amongst them 11 (52.38%) were given only soluble insulin and rest soluble + intermediate insulin.

Table-II

Mode of control of diabetic status

Mode of control	GDM (n=31)	DM (n=21)
Diet	06 (19.35%)	04 (19.05%)
Insulin	25 (80.65%)	17 (80.95%)
Soluble insulin	17 (54.84%)	11 (52.38%)
Soluble + intermediate	08 (25.80%)	06 (28.57%)

Table-III shows the past obstetric performance of the patients under study. In the GDM group there were six (8.96%) miscarriages, seven (10.45%) stillbirths, one (1.49%) neonatal death and seven (10.45%) babies were macrosomic. In DM group there were 10 (15.15%) miscarriages, five (7.58%) stillbirths, one (1.52%) neonatal death and five (7.58%) patients gave history of delivery of big babies.

Table-III

Past obstetric performance

GDM	DM
No. of pregnancy = 67	No. of pregnancy =66
Live birth : 53 (79.10%)	Live birth : 49 (74.24%)
Abortion : 06 (08.96%)	Abortion : 10 (15.15%)
Still birth : 07 (10.45%)	Still birth : 05 (07.58%)
Neonatal death : 01 (01.49%)	Neonatal death : 01 (01.52%)
	Congenital anomaly : 01 (01.52%)

$X^2 = 2.48$, p = 0.64

Maternal morbidity in the current pregnancy is shown in Table-IV. Amongst the morbidity, toxaemia of pregnancy was the commonest finding in both groups, next comes hydramnios. The incidence of toxaemia and hydramnios was 19.35% and 9.68% in GDM group and 19.05% and 4.76% in the DM group respectively. Two patients in the GDM group had repeated urinary infection and one had repeated attack of hypoglycaemia. There was one intrauterine death in the present series which occurred in the GDM group. Whether the patients had GDM or DM, there was no difference in the past obstetric performance or complications in present pregnancy (p >.05 in both situations).

Table-IV
Maternal morbidity

Type of morbidity	GDM (n=31)	DM (n=21)
Toxaemia	06 (19.35%)	04 (19.05%)
Hydramnios	03 (09.68%)	01 (04.76%)
UTI	02 (06.45%)	Nil
Hypoglycaemia	01 (03.23%)	Nil
AP IUD	01 (03.23%)	Nil

$X^2 = 3.83$, p = 0.43

Five patients (16.13%) in the GDM group and one (4.76%) in the DM group delivered prematurely. Eighteen (58.06%) patients delivered between 37 and 38 weeks and eight (25.81%) between 39 and 40 weeks in GDM, whereas 15 (71.43%) delivered between 37 and 38 weeks and five (23.81%) between 39 and 40 weeks in DM group (Fig. 1). Time of delivery did not show any difference between the two groups when compared (p = 0.41).

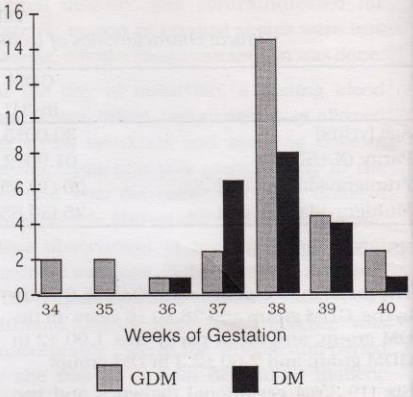

Fig.-1 : *Time of delivery of two groups of patients.*

Ten (32.26%) patients in the GDM group delivered vaginally of whom three had spontaneous vaginal delivery and seven delivered after induction. Caesarean section was done in 21 (67.74%) cases, amongst them, elective caesarean section in 17 cases and emergency section in four cases. In the overt diabetic group, seven patients (33.34%) delivered vaginally, of whom five had spontaneous vaginal delivery and two delivered after induction. Fourteen patients (66.67%) delivered by caesarean section, amongst them 10 had elective caesarean section and four had emergency section. In this study, primary sections were done in 54.28% cases and repeat section in 22.85% cases. Mode of delivery in two groups did not show any significant difference (p = 0.82).

The mean birth weight of the babies were 3.16 ±0.50 kg in GDM group and 3.00±0.55 kg in DM group. Two babies in GDM and one in DM group had weight less than 2.50 kg. Seventeen babies (58.62%) in the GDM group and 14 (66.67%) in the DM group had birth weight between 2.60 and 3.29 kg; eight (27.59%) in GDM and five (23.81%) in DM group had weight between 3.30 and 3.90 kg. There were

four macrosomic babies, three in the GDM and one in the DM group. When compared the birth weight distribution (Fig. 2) showed no significant difference between the two groups (p = 0.86).

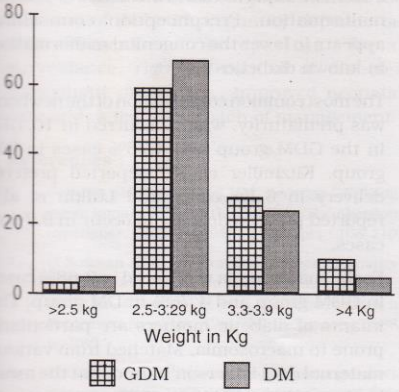

Fig.-2 : *Birth weight distribution.*

There were two (3.85%) perinatal deaths in the present series, both occurred in GDM group. One was a hydrocephalic baby delivered by destructive operation at 34 weeks and the second was a case of unexplained intrauterine death which occurred at 36 weeks.

Table-V shows the perinatal morbidity in the study group. Thirteen babies in the GDM group and five in the DM group suffered perinatal morbidity. Prematurity was the commonest form of morbidity and was present in five (1.13%) cases in the GDM group and in one (4.76%) in DM group. There were two (6.45%) congenital abnormality, both occurred in GDM group. One was a hydrocephalic baby who died and the second had an abdominal lump who survived after laparotomy. Hyperbilirubinaemia occurred in two cases (6.45%) in GDM group and in one case (4.76%) in DM group. Besides, two babies (9.52%) in the DM group suffered respiratory distress and one baby (3.23%) in the GDM developed facial palsy after forceps delivery.

Perinatal morbidity was same in both groups and no significant difference was found (p = 0.24).

Table-V
Perinatal morbidity

Type of morbidity	GDM (n=31)	DM (n=21)
Congenital anomaly	02 (06.45%)	Nil
Prematurity	05 (16.13%)	01 (04.76%)
Foetal macrosomia	03 (09.68%)	01 (04.76%)
Hyperbilirubinaemia	02 (06.45%)	01 (04.76%)
Respiratory distress syndrome	Nil	01 (04.76%)
Facial palsy	01 (03.23%)	Nil

$X^2 = 6.78$, p =0.24

Discussion :

The impact of maternal diabetes on mother and foetus is still a common clinical problem. Diabetes, in the sense of a raised fasting glucose, is accompanied by a high rate of maternal morbidity, birth defect, intrauterine foetal death, neonatal morbidity and death. This applies equally whether the condition predated pregnancy or was diagnosed during pregnancy[23]. The offspring of mothers who experience both fasting (>105 mg/dl) and postprandial (>120 mg/dl) hyperglycaemia are at greater risk of intrauterine death or neonatal morbidity[24].

The patients in this series represent a cross section of women in whom pregnancy has been complicated by diabetes. The traditional antenatal complications of diabetic pregnancy have been observed in this series.

The commonest maternal morbidity in this study was toxaemia of pregnancy which occurred in 9.35% cases in GDM group and 19.05% in DM group. Such an association has been observed by most investigators[25,26]. Hydramnios occurred in 9.68% cases in GDM group and 4.76% cases in DM group. Pederson and Pederson[27] reported a 25% incidence; other reported incidence varies from 3,7% to 17.6%[3,26]. The cause of polyhydramnios remain uncertain in most cases and is not usually related to congenital malformation of foetus. Pederson and Pederson did not demonstrate a close connection between the volume of amniotic fluid and maternal blood glucose[27]. Others, however, have stated that better control of blood glucose resulted in less polyhydramnios[28,29]. Urinary tract infection occurred in 6.45% cases which is consistent with Cousin's report[3]. The development of pyelonephritis is associated with significantly increased perinatal mortality.

Two perinatal deaths occurred in the study group. One was due to gross congenital abnormality, and the other unexplained intrauterine death; both perinatal deaths occurred in GDM group. The perinatal loss is amongst the most reported to date[6,12,28,30,31].

There were two (3.84%) congenital abnormalities in the present series, which occurred in GDM group. Homes and colleagues[32] found a 5% incidence, Gabbe and associates[19] reported a 8% incidence and Pederson[6] reported a 6% incidence of serious malformation. Preconception counselling appears to lower the congenital malformation in known diabetics[16,33,35].

The most common complication of the newborn was prematurity, which occurred in 10.13% in the GDM group and 4.76% cases in DM group. Kitzmiller et al[36] reported preterm delivery in 6.1% cases and Lufkin et al[37] reported preterm delivery to occur in 9.2% of cases.

Foetal macrosomia was found in 9.68% cases in GDM group and 4.76% in DM group. The infants of diabetic mothers are particularly prone to macrosomia. Matched from various maternal data Pederson[6] found that the mean birth weight of IDM was 500 mg more and mean length 1.5 cm greater than that in a group of controls. Gestational diabetes may cause overdevelopment of shoulders even if birth weight is within normal limit[38].

RDS occurred in 9.52% cases in the DM group and one in GDM group. Habbel and associates[10] found an overall incidence of 27% in a study of 473 lifeborn IDM and Robert and associates[9] found an incidence of 23% as compared to 1.3% in the infants of non-diabetic mothers. In both the studies prematurity and caesarean section were associated with increased incidence of RDS.

Hyperbilirubinaemia occurred in 6.45% in GDM group and 4.76% in DM group. Similar to RDS, the incidence of hyperbilirubinaemia is much less than reported series. Pederson[6] found hyperbilirubinaemia (bilirubin > 15mg/dl) in 38% of cases, Essux and co-workers[28] found it in 27% of cases and Kitzmiller et al[36] found hyperbilirubinaemia in 19% of cases. Probably the perinatal history in this study was affected by early intervention and phototherapy in many other cases.

This study emphasizes the findings of other recent studies on diabetes in pregnancy that if there is optimal maternal glucose control during pregnancy there will be no difference in GDM and DM group regarding maternal and perinatal outcome. Improvement in the outcome of diabetic pregnancy depends on improvement in antepartum foetal surveillance, rigorous control of diabetes throughout pregnancy, improved neonatal care and a team approach of management.

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Argon Laser Trabeculoplasty – Efficacy and Complication

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Summary :

Argon laser trabeculoplasty (ALT) is done for the treatment of open angle glaucoma. Due to limited scope of this therapy in our country only a few cases are done in a year. A study was carried out on 30 eyes of 20 patients. These patients were followed up for a period of three months to five years. Intraocular pressure (IOP) was controlled in 86.66% of eyes for five years. But all patients required drugs, although in reduced doses to control IOP. In most of the cases (73.33%) only pilocarpine could control IOP. In 13.33% cases pilocarpine and timolol maleate were required. Acetazolamide was not used in any patient for the long term control of IOP.

However, there was loss of effect of ALT with time. IOP was found to be raised over subsequent years. Four (13.33%) patients needed trabeculectomy to control IOP. So ALT is regarded as an intermediate step between medical treatment and conventional glaucoma surgery.

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Introduction :

Glaucoma is a potentially blinding disease throughout the world. World Health Organization (WHO) recognizes six giant causes of blindness. Glancoma is one of them and that of primary glaucoma ranks the primary position. It accounts for 10% of blindness in the world[1]. Glaucoma is the third common cause of blindness after cataract and corneal diseases in Bangladesh[2]. A study titled "Glaucoma Prevalence Survey in Bangladesh- 1993" was conducted by Bangladesh Eye Care Society in collaboration with International Glaucoma Association (IGA), London. It showed that in persons 35 years and above, the nationwide prevalence of definite primary open angle glancoma (POAG) in Bangladesh was 3.0% and that of POAG suspect was 10.8%[3].

Unlike cataract, glaucoma causes irreversible visual damage. Although it is difficult to prevent primary glaucoma yet we can half the progression of the disease and further damage can be arrested if early, timely and effective measures are taken. So early diagnosis and treatment is necessary so that the patients can retain whatever vision they have.

Conventionally, POAG is treated initially with drugs like miotics, beta adrenergic blocking agents and acetazolamide. These drugs have many side effects such as spasm of accommodation, conjunctival hyperaemia, superficial punctate keratopathy, iris cyst, cystoid macular oedema, bradycardia, bronchospasm, malaise, fatigue, depression, renal stone formation etc. Moreover, medical therapy fails to control intraocular pressure in many cases. Filtration surgery is done in these cases. However, surgical treatment has many complications like excessive drainage and hypotony, failure of adequate drainage, changes in refraction, shallow anterior chamber, endophthalmitis, cataract, malignant glaucoma and total loss of visual field.

ALT is done in the management of POAG. The results are also excellent in cases of glaucoma capsulare, pigmentary glaucoma, and aphakic and pseudophakic eyes which had POAG prior to lens extraction. Presently, it serves a logical step before conventional filtration surgery in medically uncontrolled patients, although there is a growing body of evidence that it may be appropriate as initial form of therapy in open angle glaucoma[4]. The use of ALT as

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primary treatment has been described by several authors. In countries where access to follow up are limited, ALT appears to offer many advantages. The laser therapy in glaucoma is noninvasive, quick, relatively painless and effective.

Materials and method :

In this study, patients with POAG irrespective of age and sex were included. ALT were done in BIRDEM, Dhaka, Combined Military Hospital, Dhaka and at a private clinic (Harun Eye Foundation and Green Hospital) from July '90 to June '95. The patients were examined preoperatively and followed up post-operatively. The period of follow-up was from three months to five years. All patients were investigated, treated and followed up on outpatient basis.

A protocol was prepared containing detailed history and findings of general and local examinations. Angle of anterior chamber was thoroughly studied by gonioscope and slit lamp biomicroscope to see the angle type and presence or absence of peripheral anterior synechiae. Optic disc and fundus were studied by direct ophthalmoscope in all cases and in a few cases by indirect ophthalmoscope also. Fundus photography was also done in selected cases to see progression of optic disc cupping following laser therapy. IOP was measured by Goldmann applanation tonometer. Visual field was examined by Goldmann perimeter and Bjerrum screen. Some patients were examined by Humphrey field analyser.

ALT was applied in the following procedure. The patient was informed of the need for ALT and the details of laser surgical procedure. One 250 mg tablet of acetazolamide was given 1.5 hour before the procedure. In some cases 1% aprachlonidine (lopidine) was given one hour before the treatment to blunt the post-laser pressure spike. If the pupil was not already miosed, one drop of 2% pilocarpine was also instilled one hour before the procedure. The laser settings were : spot size 50 µm, duration 0.1 second and initial power 700 mW.

One drop of 0.4% oxybuprocaine was instilled. A goniolens with anti-reflective coating was inserted. With mirror at 12 O'clock position the inferior angle was visualised. The aiming beam was focused at the junctiion of pigmented and non-pigmented trabeculum. Transient blanching or the appearance of minute gas bubble at the point of impact was considered as ideal reaction. The procedure was begun with a power level of 700 mW and carefully inspected the tissue response at this level. The power was increased or decreased in 200 mW steps until the desired tissue response was observed. It was found that the amount of power necessary was inversely proportionl to the degree of pigmentation of the meshwork. The average power setting ranged between 500 mW and 900 mW. Twenty five burns were applied at regularly spaced intervals from one side of the mirror to the other. The goniolens was rotated clockwise for 90° and a further 25 burns were applied making a total of 50 burns extending for 180° of angle. In some patients 50 burns at 180° circumference of the angle were insufficient for reducing IOP to the desired level. In those cases, a further 50 burns were applied in remaining 180° of the angle in subsequent sittings.

Results :

In discussing treatment results, success rate has been defined on the basis of several criteria, (1) control of IOP for five years, (2) absence of field progression and (3) absence of further damage to optic disc. Visual acuity (VA) remained static in most of the cases (93.33%). It deteriorated in 6.67% of cases. There was no improvement of VA in any eye. The effect on visual field was statistically similar to that of VA. In most cases (86.66%) IOP was controlled. Progression of glaucomatous cupping was not observed in any eye (Table-I).

Table-I

Results of trabeculoplasty (n =30)

		No. of eyes	Percentage
VA	Improved	00	00
	No change	28	93.33
	Deteriorated	02	06.67
IOP	Uncontrolled	04	13.33
	Controlled	26	86.67
FIELD	Improved	00	00
	Static	28	93.33
	Deteriorated	02	06.67
Fungus C:D	Improved	00	00
	No change	30	100
	Deteriorated	00	00

Table-II shows that all patients required some medication after ALT to control IOP. Twenty two (73.30%) eyes required only pilocarpine and four eyes (13.33%) required both poilcarpine and timolol for control of IOP. Acetazolamide was not used for long-term control of IOP.

Table -III shows that IOP remained controlled with drug in 26 eyes (86.66%). Trabeculectomy was done in four eyes (13.33%).

Table-IV shows the complications of Argon laser trabeculoplasty. It shows that post-laser rise of IOP occurred in 12 (40%) eyes, peripheral anterior synechiae occurred in two eyes (6.67%) and anterior uveitis occurred in eight eyes (26.66%). Hyphaema occurred in two eyes (6.67%). Other complications like corneal burn, visual field loss, pupillary distortion, angle closure glaucoma and cystoid macular oedema were not observed in any of the patients.

Table-II

Drug treatment after trabeculoplasty (n=30)

	No. of eyes	Percentage
IOP controlled without drug	00	00
IOP controlled with pilocarpine	22	73.34
IOP controlled with pilocarpine and timolol	04	13.33
Acetazolamide used for long term control of IOP	00	00
IOP could not be controlled	04	13.33

Table-III

Surgical treatment after trabeculoplasty (n=30)

	No. of eyes	percentage
Trabeculectomy required for control of IOP	04	13.33
IOP controlled with drug	26	86.67

Table-IV

Complications after trabeculoplasty (n - 30)

	No. of eyes	Percentage
Post-laser pressure spikes	12	40.00
Peripheral anterior synechiae	02	06.67
Anterior uveitis	08	26.70
Corneal burn	00	00
Visual field loss	00	00
Pupillary distortion	00	00
Hyphaema	02	06.67
Angle closure glaucoma	00	00
Cystoid macular oedema	00	00

Discussion :

In POAG, the rise in IOP is caused by increased resistance to aqueous outflow through trabecular meshwork (TM). It is postulated that ALT produces localized burns in the trabecular meshwork. This causes shrinkage of collagen in the tissue resulting in pulling or tightening of the adjacent tissues. This is thought to result in widening of the trabecular pores and a reduction in outflow resistances[5]. Thus ALT causes an enhancement of egress of fluid via the trabecular outflow system resulting in reducion of IOP.

ALT causes an average drop of IOP between eight and 10 mm of Hg in 75% of eyes with POAG[5]. It is being used in selected medically uncontrolled cases. However, in general, ALT has not allowed discontinuation of antiglaucomatous medications although some reduction in the number of medications has been reported[7,8]. Pollack and Robin noted that 64.2% of the patients who previously required carbonic anhydrase inhibitor were satisfactorily controlled without it[9]. Moulin and Haut[10], who carried out a study in 159 eyes for five years following ALT, noted that medical treatment remained the same in 57% and was tapered or stopped in 43%. The results of this current study is also similar to these observations. However, in none of the patients IOP could be controlled without drugs. This may be explained by the fact that glaucoma is detected late in this country. In 73.34% of the eyes, IOP was controlled only with 2% pilocarpine and rest 13.33% cases required both pilocarpine and timolol maleate. Acetazolamide was omitted from all the patients.

From the outset it was recognized that there was some loss of effect of ALT with time[10]. It happened in these cases also. In four (13.33%) eyes IOP was controlled initially with pilocarpine and later with both pilocarpine and timolol. Trabeculectomies were done in these four eyes for control of IOP. However, in five (16.66%) eyes pressure was well controlled (in the range of 10-13 mm Hg) with only pilocarpine drop even for five years after ALT. Moulin and Haut[10] followed up 127 eyes for 10 years after trabeculoplasty. They showed that pressure was controlled in 11% of the eyes even 10 years after ALT.

The most serious complication of ALT is the post-treatment acute elevation of IOP resulting in loss of vision[10]. Ritch and Solomon showed that intraocular pressure elevation occurred in upto 53% of eyes when 360° of trabecular meshwork had been treated with 100 spots in a single session[11]. Here 50 were done over 180° of trabecular meshwork in the first session. Pressure elevations occurred in 40% of cases. Elevation of IOP caused loss of vision in none of the patients.

The outstanding feature of laser trabeculoplasty is its overall safety and convenience. It can be a useful, effective, simple and low-risk office procedure in the management of open angle glaucoma. Patients should be carefully selected, and those with advanced glaucomatous diseases should be pretreated and closely monitored for post-operative intraocular pressure elevations. If and when the procedure fails, conventional medical and surgical therapy may be resumed.

Laser trabeculoplasty may be safer than life long multidrug therapy, which far too often leads to disc damage after years of borderline control and/or borderline patient compliance. The success rate is comparable to surgical trabeculectomy in adult primary open angle glaucoma. Among certain patient population, such as elderly and black patients, the results may be superior to standard surgical therapy, because laser trabeculoplasy appears to produce long-term reversal of major pathophysiological mechanism of primary open angle glaucoma. This method of glaucoma therapy may reduce or eliminate the need for prolonged medical therapy in many patients with this disease[11].

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Urinary Calcium-Creatinine Ratio in Normal Pregnancy and Pre-Eclampsia

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Summary :

Different biochemical alterations occuring during normal pregnancy and pre-eclampsia have been observed by researchers and some indicators for early prediction of pre-eclampsia were suggested. This study was done to see the urinary excretion of calcium and creatinine and calcium-creatinine ratio in two hour single voided urine sample collected from non-pregnant, normal pregnant and pre-eclamptic women. The urinary calcium in normal pregnant women did not differ from that of non-pregnant women. However, it was significantly lower in pre-eclamptic women ($p<0.001$). Urinary excretion of creatinine was significantly higher in normal pregnant ($p<0.05$) and pre-eclamptic women ($p<0.02$). Urinary calcium-creatinine ratio was significantly lower in normal pregnant ($p<0.01$) as well as in pre-eclamptic women ($p<0.001$). The calcium-creatinine ratio in pre-eclamptic women was less than 0.04. Detection of low calcium-creatinine ratio (<0.04) in early weeks of gestation may be an important predictor for early detection of pre-eclampsia, as was suggested by other authors.

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Introduction :

Pre-eclampsia is a common obstetric disorder characterised by hypertension, proteinuria and/or oedema occurring after 20 weeks of pregnancy[1]. Eclampsia remains a serious complication of pregnancy, estimated to complicate one in 100 to one in 1700 deliveries in the developing countries[2]. It is an important cause of both perinatal and maternal morbidity and mortality[3]. Dakker and Sibia[4] suggested that though the signs and symptoms of pre-eclampsia appeared at a relatively late stage of pregnancy but the underlying physio-pathological mechanism appeared to occur much earlier, between eight and 18 weeks of gestation and emphasized that it was necesssary to search for early prediction of this disorder. Different biochemical parameters were studied by the investigators in this respect. Some data suggest that there is a derangement of calcium homeostasis in pregnancy and calcium might be implicated in the development of pre-eclampsia. McCarron et al[5] suggested that various forms of hypertension might be associated with abnormalities of calcium regulation. Hassan et al[6], Pitkin[7] and Mustarin et al[8] observed decreased serum calcium level in pre-eclamptic women. Taufield et al[9] and Hukeshoven and Duijdorhoudt[10] observed a decrease in urinary excretion of calcium in pregnant women with pre-eclampsia. However, others[11] observed no change in the urinary excretion of calcium in normal pregnancy and hypertensive women. Rao and Roman[12] and Egwunatu[13] observed a high serum creatinine concentration in the pre-eclamptic women compared to normal pregnant women. Others[12] studied urinary excretion of creatinine in pregnancy and observed no differences between normal pregnancy and pre-eclamptic women.

The present work was designed to study urinary excretion of calcium and creatinine, and urinary calcium-creatinine ratio in normal pregnancy and pre-eclamptic women in local centext.

Materials and method :

The study was carried out on 54 female subjects of whom 12 were non-pregnant

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(control) and 42 were pregnant (experimental group). The subjects of the exporimental group were selected from pregnant women attending the Model Family Planning Clinic of Sylhet Osmani Medical College and private clinic of an obstetrician and gynecologist for periodic check up. The subjects of the control group were selected from female doctors. The age of the women ranged from 20 to 35 years. A complete history was taken and the gestational age was determined by the first day of last menstrual period and was confirmed by the height of the uterus. Sixteen pregnant women were normotensive, were without any evidence of significant preteinuria and were considered as normal pregnant women. Another 26 pregnant women presented with the manifestation of pre-eclampsia i.e. blood pressure more than 140/90 mm Hg, daily excretion of urinary protein more than 300 mg, and with or without oedema. Single voided urine was collected in a sterile test tube in the early hours of the day. Calcium in the undiluted urine was estimated after Gitelman[14]. Calcium ion reacts with o-cresolphtheline complexone in an alkaline medium to form a purple color complex. The absorbance of this complex is proportional to the calcium concentration in urine. Calcium kit, Calcium Liquicolor Photometric Colorimetric test (Human, Germany) was used. All test tubes and pipettes were washed with N/10 nitric acid and then with deionized water.

Separate test tubes and pipettes were used for calcium estimation. Creatinine was estimated after Jaffe' method without deproteinization[15]. Creatinine forms a coloured complex with picrate in alkaline media. The rate of the complex formation is measured at two points in two minutes. Fresh urine was diluted in 1 : 50 with redistilled water. Creatinine Liquicolor, Human GmbH (Germany) was used and the level of creatinine was measured in spectrophotometer (Spectronic 20D, USA). Statistical analysis of the results was done by unpaired students' t-test.

Results :

The results are presented in Table-I and the statistical analysis of results are shown in Table-II.

Table-I

Urinary calcium, creatinine and calcium-creatinine ratio in non-pregnant (Group-A), normal pregnant (Group-B) and pre-eclamptic women (Group-C)

Groups	Mean urinary calcium mg/dl ± SEM	Mean urinary creatinine mg/dl ± SEM	Calcium-creatinine ratio ± SEM
Non-pregnant (Gr. A) ; n = 12	13.79 ±1.24	45.16 ± 4.60	0.336 ± 0.187
Normal pregnant (Gr. B); n = 16	9.75 ± 1.6	70.60 ± 11.0	0.192 ± 0.048
Pro-eclamptic (Gr. C); n= 26	2.43 ± 0.32	78.90 ± 8.9	0.034 ± 0.004

Table-II

Statistical analysis of results in Table-I by unpaired students' t- test

Groups	df	Urinary calcium		Urinary creatinine		Calcium-creatinine ratio	
		t	p	t	p	t	p
Gr. B vs Gr. A	26	1.91	NS	2.11	<0.05	2.45	<0.02
Gr. C vs Gr. A	36	12.09	<0.001	2.53	<0.02	21.18	<0.001
Gr. C vs Gr. B	40	5.67	<0.001	0.589	NS	4.1	<0.002

The mean (± SEM) urinary calcium concentration were 13.79 ± 1.24 mg/dl, 9.75 ± 1.6 mg/dl and 2.43 ± 0.32 mg/dl in non-pregnant (Group- A), normal pregnant (Group-B) and pre-eclamptic women (Group- C) respectively. The urinary calcium in normal pregnant women did not differ from that of non-pregnant women (P >0.05). However, the urinary calcium concentration was significantly lower in pre-eclamptic women group than that of non-pregnant (p<0.001) and normal pregnant women. (p<0.001). The mean (± SEM) concentration of creatinine were 45.16 ± 4.60 mg/dl, 70.60 ± 11.0 mg/dl and 78.90 ± 8.9 mg/dl in non-pregnant, normal pregnant and pre-eclamptic women group respectively. The urinary excretion of creatinine in a single voided urine was significantly higher in normal pregnant women (p<0.05) as well as in the pe-eclamptic women group (p<0.02) as compared to that of non-pregnant women. However, the urinary creatinine level in normal pregnant and pre-eclamptic group did not differ. Calcium creatinine ratio in the single voided urine were 0.336 ± 0.187, 0.192 ± 0.048 and 0.034 ± 0.004 in non-pregnant, normal pregnant and pre-eclamptic women respectively.

Urinary calcium-creatinine ratio was significantly lower in normal pregnant (p<0.02) as well as in pre-eclamptic women (p<0.001) as compared to that of non-pregnant women. This ratio in pre-eclamptic women was further lower than that of normal pregnant women (p<0.002).

Discussion :

In this study the mean urinary excretion of calcium was lower in normal pregnant women as compared to that of non-pregnant women but was not so pronounced. However, the mean urinary calcium excretion was significantly lower in pre-eclamptic women than that of non-pregnant and normal pregnant women. Some other authors[9,10] also observed hypocalciuria in the hypertensive and pre-eclamptic women. Taufield et al[9] suggest that hypocalciuria in pre-eclamptic women might be due to increased tubular reabsorbtion of calcium rather than reduced filtered load of calcium. They also postulated that this reduced excretion in the pre-eclamptic women was not associated with decreased sodium excretion suggesting an increased distal rather proximal tubular reabsorbtion. However, the exact mechanism still remains obscure.

In the present study, increased excretion of creatinine in urine in both normal pregnancy and pre-eclamptic women as compared to that of non-pregnant women was noticed. It was also found that the urinary calcium-creatinine ratio in the normal pregnant and in the pre-eclamptic women was strikingly lower than that of non-pregnant women, and in the pre-eclamptic women the ratio was even lower. Huikeshoven and Zuijderhaudt[10] observed a correlation between the urinary calcium-creatinine ratio of a single voided urine sample and 24 hours urinary calcium excetion. Radriquez et al[16] observed a low urinary

calcium-creatinine ratio (≤0.04) in between 24 and 34 weeks of pregnancy and established that those pregnant women subsequently developed pre-eclampsia. They suggested that urinary calcium-creatinine ratio might be a useful screening tool in predicting the subsequent development of pre-eclampsia.

Confirming available data, it may be suggested that hypocalciuria and low calcium-creatinine ratio may be of particular importance in early prediction of pre-eclampsia and deserve further extensive investigations.

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REIVEW ARTICLE

(J Bangladesh Coll Phys Surg 1997; 15 : 28-36)

Cholesteatoma-A Critical Review

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Introduction :

In the year 1807, Dupuytren and Prestre described a pearl-like tumour in the middle ear as reported by Cruveil Heirs in 1813[1,2]. It was Muller in 1838 who described a similar lesion and named it cholesteatoma[3,4] and ilustrated that it behaved like an uncontrolled growing tumour that appeared to have no blood supply and no nucleated cells and grew in splendid isolation from its environment with the capability of destroying both the soft and hard tissue surrounding it[5,6].

Cholesteatoma is a whitish shiny sac lined by stratified squamous epithelium which is slowly progressive and destructive disease of the middle ear cleft consisting of concentric layers of keratin materials impregnated with desquamated squamous epithelium with or without cholesterol and is a common finding in otological practice by otorhino-laryngologists[7-15].

There is a strong link between cholesteatoma and chronic otitis media or other chronic conditions of the ear and its ventilatory system[16]. The majority of cholesteatoma assume fairly typical pattern of growth that are dictated by their site of origin and its related anatomical structure[17]. Cholesteatoma presents to otolaryngologists with a variety of diagnostic and therapeutic challenges[18-20].

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One hundred years ago cholesteatoma was a fatal disease. Early diagnosis and removal prevent complications[11-20]. If left untreated it can cause gradual hearing loss ultimately causing serious complications both intracranial and extracranial[21]. It is a common finding in otological practice specially in Bangladesh, where we have a good number of cases presenting with complications. Diagnosis of cholesteatoma is mainly the responsibility of the otologist based on otoscopic findings with the help of otoscope and binocular microscope. In a small middle ear cholesteatoma, a congenital cholesteatoma and in case where otoscopy is difficult or impossible, help of radiology and imaging may be necessary[22]. Introduction of CT Scan and MRI in the diagnostic field of radiology and imaging has increased the capability of imaging to a great extent in the diagnosis of cholesteatoma, though one must remember the limitations of these investigations to tell the exact histopathology of the lesion[23]. Audiological examinations though not essential for diagnosis, yet the assessment of hearing showing amount of hearing loss may give clue to the presence of cholesteatoma. It is extremely helpful in assessing the improvement of hearing or otherwise, after surgical intervention[24-27].

Incidence :

The prevalence data of 107 consecutive patients seen in the Department of Otolaryngology, All India Institute of Medical Sciences, New Delhi, India. by Kacker showed the incidence to be as follows : (a) congenital cholesteatoma - 0.93%, (b) primary acquired cholesteatoma *(pars flaccida)* -23.36% and (c) secondary acquired cholesteatoma *(pars tensa)* - 75.71%. The incidence of cholesteatoma presenting with complications has

been reduced to a greal extent after invention of effective antibiotics and introduction of binocular microscope in the clinical practice, making it possible to diagnose and treat early[28-30].

Causes and classificaton :

The aetiology of cholesteatoma depends on its type. The cholesteatoma may be congenital or acquired[9]. Congenital cholesteatoma is manifested in most cases in early childhood as a lesion of the cerebello-pontine angle, inside the cranium, within the petrous apex of the temporal bone, the middle ear, the mastoid or the external auditory canal with an intact tympanic membrane. The petrous portion of the temporal bone is a deep and insensitive region that tolerates expansible lesion after until they become quite advanced, symptoms arise when adjacent intracranial or intratemporal structures are eroded and demaged[31]. Acquired cholesteatoma, on the other hand, presents in late childhood and in young adults as a lesion predominantly of the posterosuperior part of the middle ear with a perforation usually of the *pars flaccida* region of the tympanic membrane[32]. Acquired cholesteatoma can be classified further in three categories[33-36]. The most common form is primary acquired cholesteatoma which arises from a skin lined retraction pocket within which retained keratin debri accumulate. The second type is secondary acquired cholesteatoma which develops from an ingrowth of skin through a typmanic membrane perforation that is retained within the middle ear, mastoid or both. The third variety is residual or recurrent cholesteatoma arising on the residual growth after surgery or following unsuccessful surgery.

Clinical features :

In its early stage, cholesteatoma is completely asymptomatic and may be compatible with normal hearing and a dry ear. As the keratoma mass expands there is slow destruction of ossicles. The diagnosis of cholesteatoma in adults is not difficult clinically[37]. Common clinical presentation of cholesteatoma with or without complications are foul smelling scanty yellowish and occasional blood stained discharge from ear, hearing impairment, earache, post-auricular discharging sinus or abscess, aural polyp, nasal obstruction, vomiting, vertigo, headache, facial nerve paralysis, tinnitus, neck rigidity, fever, imbalance of gait, sagging down of postero-superior auditory canal wall, attic perforation, marginal perforation, retraction of tympanic membrane with perforation and sometimes blurring of vision, dysphagia, dysphasia and fever with rigors. It is not uncommon to see rapid expansion of a cholesteatoma when there is secondary infection of the cholesteatoma.

Children with cholesteatoma, on the other hand, may go undetected for several years until present with some complications. The delay in presentation may be due to the lack of awareness. Attic cholesteatoma are particularly troublesome in that they often manifest themselves only as small crust on harpnel's membrane *(pars flaccida)*.

It is easier to diagnose cholesteatoma clinically in a developing country like ours as many of the cases present late with advanced diseases and not uncommonly with complications. Presenting with a discharging sinus behind the ear or with a post-auricular sinus through which a cholesteatoma can be seen is a common feature. Subperiosteal abscess like post-auricular abscess, zygomatic abscess and Rezold's abscess with acute symptoms like pain and fever may present due to secondary infection in a cholesteatoma mass. Facial nerve palsy, lateral sinus thrombosis, labyrinthitis, meningitis and brain abscess may be the first presenting symptoms on many occasions. Intense and unbearable fluctuating headache on one side with history of discharging ear is also highly suggestive of cholesteatoma irritating the dura[38].

Complications :

A case of chronic suppurative otitis media with cholesteatoma is more prone to complications. The mechanism of action of

cholesteatoma is thought to be due to its psysico-chemico-biological effects. The complications may be intracranial, intratemporal and extracranial[38-41], and are : extradual abscess, subdural abscess, perisinus abscess, localised otitic meningitis, generalised otitic meningitis, encephalitis, lateral sinus thrombosis, otitic hydrocephalus, cerebrospinal otorrhoea, brain abscess (acute and chronic; may be temporal and cerebellar), cortical thrombophlebitis, labyrinthitis (localised and generalised; serous or purulent), petrostitis, facial paralysis, mastoiditis (acute or masked or chronic), subperiosteal abscess, otitis externa, osteomyelitis of adjoining bones of ear (acute or chronic), acquired deafness due to meningitis or labyrinthitis, almost total unilateral and rarely bilateral deafness, septicaemia, pyaemia and metastatic abscess in the lungs, joints, bones and else where in pyaemic cases. The commonest of all complications are mastoiditis and labyrinthitis.

Diagnosis of cholesteatoma[41-48] :

The management of cholesteatoma is based on thorough clinical assessment by a careful evaluation of the history and examination supported by some rationale investigations and early treatment. Investigations include tuning fork tests, fistula test, X-ray of petro-mastoid regions, isotope scan of brain, and CT scan and MRI of petro-mastoid regions including brain in selected cases. Audiometry and vestibulometry may be done in those who present with vertigo. Routine haematological examination and aural swab culture should be done in all the cases. Pre-operative microscopic examination of ear is done in highly suspicious cases and also based on operative findings and may be with other relevant investigations as and when required. Diagnosis of a case of cholesteatoma is detailed below :

History of the patient : A detailed history of the disease from the patient or guardian play an important role to make the otologist conscious about the presence of cholesteatoma in a case of chronic suppurative otitis media. History of scanty thick foul smelling discharge which at times may be blood stained from the affected ear or ears with or without hearing impairment give important clue towards the existence of a cholesteatoma. Symptoms like tinnitus, earache, headache and vertigo give indication of complications[1-7].

Clinical examination : This is most important in the definitive diagnosis of cholesteatoma by demonstrating cholesteatoma sac or desquámated skin in the middle ear or retraction pocket with accumulation of desquamated material. Examination of the ear with an otoscope reveals interesting findings like marginal perforation in the attic or postero-superior quadrant of tympanic membrane through which shiny white cholesteatoma sac or mass may be seen. Sometimes the area may be covered with a slough which when removed may show the perforation and the cholesteatoma. Occasionally there is granulation tissue or aural polyp formation, thus obscuring the pathology underneath. Polypectomy or removal of granulation tissue is essential to visualise the cholesteatoma, if present[1-19].

Investigations[1-63] : (1) Live voice whisper tests : They are of limited value for detection of deafness in cholesteatoma since standardization is impossible. Normal range of whispered voice is upto 12 feet. and conversation voice upto 20-40 feet.

(2) Tuning fork tests : Tuning fork tests are qualitative tests which give an idea whether hearing impairment is present or not, and whether it is conductive or perceptive type.

(3) Fistula test : Fistula test confirms whether any fistula is present in bony labyrinth.

(4) Evaluation of eustachian tubal function : To see the functional capacity of the eustachian tube for aeration and clearance of middle ear cleft.

(5) Examination of ear under microscope : Introduction of binocular microscope in the clinical examination has greatly increased the possibility of demonstrating even small cholesteatoma by magnification. Thus making it possible to have a definitive diagnosis in the out-patient clinic. The shortcomings of otoscopic findings are that it does not give clear idea about the size and extension of the disease nor is it possible to ascertain definitely whether there is any existing complication specially intracranial. It is not unusual to see a big cholesteatoma mass hanging in the postero-superior part of the deep meatus coming out through the destroyed outer wall of the epitympanum and/or postero-superior meatal wall.

(6) X-ray of petromastoid regions : Diagnosis of cholesteatoma is basically the responsibility of otologist by otoscopic findings. Radiological help may be requested only when otologist is in doubt about the diagnosis or when planning of surgical treatment of cholesteatoma is made[3-11]. Radiological help should be requested only after thorough examination of the ear with the help of otoscope and binocular microscope. Under no circumstances it should be asked to compensate for the clinical deficiency of otologist[7-16]. Definitive diagnosis of middle ear cholesteatoma is still based on otoscopic findings. But in rare cases where otoscopic examination is difficult or impossible due to congenital narrowing of the external auditory canal and presence of exostosis and mucous polyp, radiology is of extreme help to assist the otologist in the diagnosis[3-17]. In case of primitive or congenital cholesteatoma, otoscopic examination is not of much help, except in some cases where the cholesteatoma is limited to the middle ear. Demonstration of sclerosed mastoid bones with chronic discharging ear is compatible for havang a cholesteatoma but cholesteatoma can very well occur in a pneumatized mastoid bone. Demonstration of a cavity with or without sclerosed margin indicating erosion of bone is indicative of cholesteatoma and presence of soft tissue mass in a cavity is more evidential for a cholesteatoma[12-21].

(7) CT Scan of petromastoid regions including brain : CT scanning has considerably increased the effectiveness of radiologist in assisting the otologist in the diagnosis and planning of surgical treatment of cholesteatoma[4-11]. CT scan is most useful in the diagnosis of congenital cholesteatoma of petrosa and other bones of the skull. It is very helpful in providing precised and accurate information regarding size and extension of the cholesteatoma particularly towards dura and petrous apex. It is extremely useful to identify low hanging dura, protruding lateral sinus, existence or threat of a labyrinthine fistula as well as early recognition and localization of intracranial abscesses. It can also reveal an extremely small sized cholesteatoma formation in the middle ear[22-27]. In describing the usefulness of CT scan, one must remember the limitation of this investigation since it does not throw any light on the histological nature of the pathology[23]. It is not a reliable investigation in screening for residual cholesteatoma and it can not be the substitute for second stage procedure of intact canal wall technique chosen for mastoidectomy [28-30].

Workers varied in their opinion about the accuracy of CT scan in identifying the histological nature of soft tissue within the middle ear cleft. Workers at Istanbul Social Security Hospital who studied 21 consecutive surgically treated cholesteatomas of the middle ear cleft reported to have found excellent cor-

relation between CT interpretation and surgical findings whereas other workers found CT scan not very accurate in identifying the difference between cholesterol grahuloma, granulation tissue and cholesteatoma in most cases as the osteitic changes could be similar[17].

(8) MRI of petromastoid regions including brain : MRI can claim supremacy in the imaging diagnosis of smaller lesions over CT scan. By MRI, soft tissue texture is better seen and by CT scan hard tissue texture is better seen[5-13].

(9) Radioisotope scan : It helps in the diagnosis of intracranial complications viz menigitis, lateral sinus thrombosis, brain abscess etc.

(10) Audiological assessment : Audiological tests give idea about the quality as well quantity of hearing loss, though are not very important in the definitive diagnosis of cholesteatoma yet hearing loss about 60 dB specially in case of chronic suppurative otitis media indicate ossicular chain disruption, and since cholesteatoma is a destructive disease the inference about the presence of cholesteatoma thus demands thorough examination and investigations to prove or disprove whether pre-operative assessment of hearing compared to post-operative hearing level is useful in evaluating the result of treatment[1-7,13-27].

(11) Nystagmus : As the symptom of vestibular labyrinth is vertigo, the sign is nystagmus by which we can see the status of labyrinthitis.

(12) Electro-nystagmography : It is the most modern method and useful tool in the evaluation of vestibular function in which eye movements are graphically recorded to find out vestibular labyrinthitis.

(13) Vestibulometry : It is done in those who present with vertigo to assess their function of vestibule and identify the various related diseases. It is also capable of testing patients with ear drum perforation and chronic ear disease[14-25].

(14) Romberg's test : It is positive in labyrinth affection, patients will often fall to the side of a recent lesion.

(15) Finger -nose test : It is useful in detecting the cerebellar abscess.

(16) Electroencephalography (EEG) : It has role in case of intracranial complications.

(17) Arteriography : In arteriography, shifts, avascular areas and capillary blush are the features of an abscess but its accuracy has been questioned.

(18) Ventriculography : It shows shift of brain ventricles in brain abscess.

(19) Lumber puncture : It is useful for CSF study in meningitis.

(20) Haematological and bacteriological assessment : Routine haematological tests and aural swab stain and culture should be done in all the cases[1-10].

(21) Assessment based on operative findings : In many occasions only during surgery the diagnosis of cholesteatoma and its extension can be confirmed[14-15].

Differential diagnosis[17-39] :

(1) Malignancy of middle ear cleft : These are of squamous cell carcinoma type. Fifty percent cases usually give history of long standing chronic suppurative otitis media. Combined surgery and radiotherapy is the treatment of choice. (2) *Bell's palsy :* It is the commonest cause of facial palsy. Commonly follows an episode of cold exposure. (3) *Glomus jugular tumour :* Pulsatile tinitus, deafness and rising sun appearance of the tympanic membrane or an aural polyp with or without lower cranial nerve palsy are the usual presenting features. Surgery or radiotherapy is the treatment of choice. (4) *Eosinophilic granuloma :* This is a variant of histiocytosis X, osteolytic lesions with trabeculations may be found. Diagnosis

is histopathological. (5) *Tuberculosis of middle ear cleft :* Mostly secondary to the pulmonary tuberculosis. Foul smelling discharge with multiple perforation in the tympanic membrane with deafness is the presenting feature. (6) *Wegners granuloma of ear :* C-anka test is positive.

Treatment of cholesteatoma[5-21] :

The treatment of cholestea may be described as follows :

Conservative treatment : (i) Shallow retraction pockets in attic and postero-superior quadrant may be kept under observation. Such pockets are self-cleaning and remain asymptomatic.

(ii) In case the pockets are deeper, suction clearance and instillation of rectified spirit drops is standard treatment. All such cases should be available for regular follow up.

Surgical treatment : (i) Small sac cholesteatoma : Bondy's atticotomy or removal of outer attic wall is all that is needed to uncap the sac. The exposure deactivates cholesteatoma and makes the ear safe and self cleaning.

(ii) Cholesteatoma extending to aditus : The inside out approach is extended upto the fundus of the sac. The sac is excised along with the matrix. The outer limit of the sac is recognised by the fact that fluid can be sucked out from its outer edge.

(iii) Cholesteatoma extending to antrum : A modified radical mastoidectomy with tympanoplasty is the treatment of choice in such cases.

(iv) Cholesteatoma with epithelised middle ear or with sensorineural hearing loss : In such cases a radical mastoidectomy without tympanoplasty gives a dry ear. Later on, a hearing aid is fitted.

(v) Cholesteatoma with complications : The treatment of complications take precedence over hearing improvement. In all such cases preservation of life is more important. After mastoid surgery the ears are generally safer and complications both intracranial and extracranial are less common though not completely eliminated.

Preventive measures :

Most of the cholesteatomas arise in childhood secondary to secretory otitis media. The prevention can be done by use of grommets, adenoidectomy and other treatment required for secretory otitis media. Removal of outer attic wall may prevent some cholesteatomas for going into mastoid antrum.

Discussion :

Males are affected more by cholesteatoma than females and commonly present in second followed by first decade of life[1-5].

There is a close correlation between patients with cholesteatoma and socio-economic status, poors having higher incidence[6-10]. The disease prevalence is less in higher socioeconomic status patients due to hygienic living, improved sanitation, good nutrition and proper medicare leading to less chance of upper respiratory tract infection and otitis media[11-15]. Educated are less affected, this indicates that the disease has got direct relationship with education, nutrition and socioeconomic condition[16-21]. Rural people are more affected than urban people and bathing in contaminated water causes rapid progress of the disease[21-30].

Many of the patients present with multiple symptoms and signs in developing countries, where as in developed countries, patients come early for treatment with limited clinical features. Only one to seven percent cases present with bilateral choleseatoma, and majority are unilateral[31-37]. Twenty to twenty five percent present with extracranial complications and one to two percent with intracranial complications in developing countries. Extracranial and intracranial complication rates are higher in developing countries than in developed countries because patients are educated and treatment facilities

are available[8]. Mastoiditis is a common complication found in many patients studied[38-40].

In developing countries, perforation of the ear drum is more common than those of developed countries[8]. This may be due to delayed presentation of patients [15-21].

In our country, majority of the patients usually have involvement of the whole middle ear cleft which is in contrast to the finding from other authors due to the fact that our patients present in late state[24]. In developed countries, majority of the patients present at an early stage and thus there is involvement of only the attic region[41].

Introduction of operating microscope has increased the capability of definitive diagnosis of cholesteatoma to a great extent[42-63]. So, radiological help must not be requested unless the ear is examined with binocular microscope. Radiology and imaging play a very significant and interesting role in the diagnosis of cholesteatoma when the pathology is a congenital cholesteatoma and in case of identifying the position of some of the very important anatomical structures like position of dura and lateral sinus[8-17]. It is most useful to ascertain the size and extension of the disease specially in planning the surgical management[19-31]. Diagnosis of complication like intracranial abscesses and labyrinthine fistulae has helped in saving many lives[27].

It is really very encouraging to note that the diagnosis of cholesteatoma in vast majority of the cases is possible by thorough and adequate clinical examination[1-21]. Sophisticated but very costly procedures like CT scan and MRI are not essential in most of the cases of cholesteatoma diagnosis. So people who cannot afford CT scan or MRI need not have to regret as clinical efficiency can compensate for those investigations to a considerable extent[19-29]. Positive diagnosis of cholesteatoma can only be made by otoscopic examination which is basically the responsibility of otologist. Thus in most of the cases only clinical examination is sufficient to diagnose cholesteatoma[1-63].

Definitive treatment of cholesteatoma is surgical removal at an earliest date to save life and to prevent complications[21-30]. All operations should be done under general anaesthesia. Meatal incision is adequate for atticotomy or limited bone removal for inspection of lateral facial recess[35]. Endaural incision is used for hypocellular mastoids and postaural for mastoids with good cellularity and also in children, in revision surgery and in cases with subperiosteal abscess or suspected otogenic complications[63]. Surgery by mastoid drill is preferred to gouge and hammer[58]. Open mastoid technique is preferred to intact canal wall technique[39]. All patients need investigation by audiometry, aural swab culture and sensitivity, radiology of mastoid, and eustachian tube function study[1-31]. Early diagnosis and treatment of cholesteatoma by well trained otolaryngologists can avoid many complications like hearing impairment leading to disability and handicap, and intracranial complications leading to morbidity and mortality[1-63].

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CASE REPORTS

Schwannoma of the Median Nerve

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Summary :

A case is reported in which a large tumour (Schwannoma) of the median nerve was removed from the right forearm of a fifty-year-old woman without much difficulty. Despite a flat sheet like appearance of the left-over affected part of the nerve trunk after the tumour excision, the result was good.

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Introduction :

Schwannomma is a benign tumour and it arises from the neural crest-derived schwann cells[1]. A common site is the auditory nerve and may be bilateral. The tumour may occur on spinal nerve roots and indeed on any large peripheral nerve trunk[2,3,4]. Regardless of site, schwannommas share a common gross and microscopic appearance. Tumours are firm and grey masses but may also have areas of cystic changes and a yellow, xanthomatous appearance[1,2].

Case report :

A fifty-year-old lady presented with a swelling on the volar aspect of her right mid-forearm and with tingling and numbness in her hand and fingers. The swelling was there for the last fifteen years with a slow but gradual increase in size; the paraesthesia, particularly after some house-hold work, had developed since about six months.

On examination, the swelling was 10 cm X 5 cm in size, oval in shape, firm in consistancy, slightly mobile from side to side and the overlying skin was normal. It was not compressible and there was no bruit. There was also no neurovascular deficit. It was decided to explore the swelling.

Under general anaesthesia and tourniquet in the right arm, the swelling was explored through a Y-shaped incision over the swelling. The mass was found within the median nerve covered completely by the stretched and splayed out nerve fibres all around. The nerve proximal and distal to the lesion was completely normal (Fig.-1).

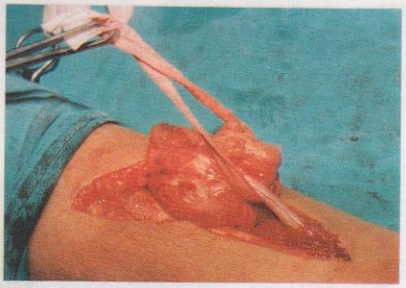

Fig.-1 : *Schwannoma arising from the median nerve.*

A longitudinal incision was made in the epineurium at a site of the scanty nerve fibres to expose the swelling (Fig.-2). It was greyish, capsulated, and lobulated with a cystic change in one area aspiration of which revealed yellow fluid.

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Recept : Oct 01, 1995 Accepted : Dec 15, 1996

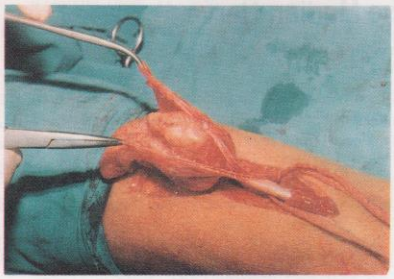

Fig.-2 : *Schwannoma exposed by incising the epineurium.*

It was possible to remove the entire swelling by blunt dissection. The affected area of the nerve after the excision of the mass remained as a flat sheet, due to the stretched and spread out but otherwise intact nerve fibres. The incised epineurium was left unsutured. Haemostasis was achieved after tourniquet release and the wound closed in layers without any drain. A compression bandage was applied.

The post-operative period was uneventful and the wound healed with primary intention. The hand function was normal (Figs.-3 and 4). Histopathology revealed a schwannoma (Fig.-5). At a recent follow-up she was found well and symptom free.

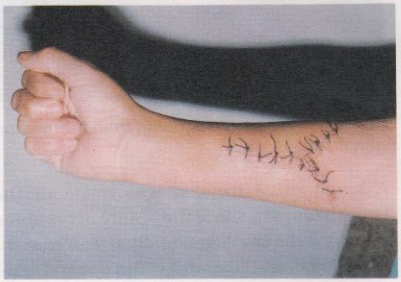

Fig.-3 : *Hand function after the operation (flexion of fingers).*

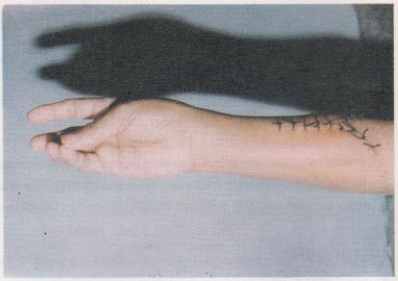

Fig.-4 : *Hand function after the operation (opposition of the thumb).*

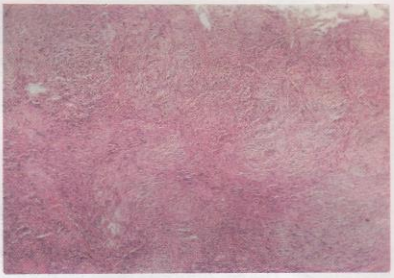

Fig.-5 : *Microphotograph of the histopathology of the tumour showing whorled arrangement of the spindle cells consistent with schwannoma (X 40)*

Discussion :

Schwannoma in peripheral nerves is uncommon, and a large one like in this case and of fifteen years duration is possible only in a developing country where medical facilities are inadequate. Although the nerve fibres were stretched grossly, there was no neurological deficit as it occurred very slowly over a long period of time. It is well known that a peripheral nerve can withstand progressive stretching of upto one millimetre per day as seen during the procedure of instrumental limb lengthening.

In schwannoma, no nerve fibre is present in the body of the tumour, although the affected nerve may be seen compressed to one side[1,2,3]. In neurofibromas, by contrast, nerve fibres are found scattered throughout the tumour mass. This distinction has practical significance, since compression to one side of the nerve of origin in a schwannoma raises the possibility of its removal without requiring transection of the nerve, a course of action not possible in neurofibromas in which the entire nerve is involved in the tumour process.

Malignant transformation may occur in both types of tumours[5,6] but is much less frequent in schwannomas[1].

Acknowledgement :

I like to express my gratitude to Professor Motior Rahman for referring this patient, and reviewing the manuscript.

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Malacoplakia of the Bladder : A Case Report

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Summary :

Malacoplakia in a 35-year old women is presented. Histopathological examination corfirmed the diagnosis. Combination of surgery and medical management resulted in an uneventful recovery.

(J Bangladesh Coll Phys Surg 1997; 15 : 40-42)

Introduction :

Malacoplakia is an unusual inflammatory disease that has been found to affect most commonly the genitourinary tract[1]. Originally observed by von Hansemann in 1901, malacoplakia often mimics carcinoma clinically and presents diagnostic as well as management problem to the clinician[2]. This report is on a patient with bladder malacoplakia that simulated a malignant tumour. By reviewing the literature, the aetiology as well as the surgical and medical management of this condition are described.

Case report :

A 35-year old woman was admitted to K.C. Memorial Hospital, Dhaka on 22.5.96 with a 2-month history of a painful visible lump in the suprapubic region. For the last six months, she had been suffering from recurrent fever and dysuria, weakness and weight loss. She was treated with short courses of sulphamethoxazole-trimethoprim, amoxicillin and cephalosporin on different occasions. On physical examination, she was found to be emaciated and anaemic with a normal temperature. A tender suprapubic lump was visible and palpable before and even after emptying the bladder.

The white blood cell count was 7.01 X 10^9/L. The crythroctye sedimentation rate was 42 mm in first hour; haemoglobin was 9.5 g/dl. Fasting glucose and creatinine levels were normal. Urine analysis revealed microscopic haematuria (10-12 RBC/HPF) and pyuria (plenty of pus cells/HPF). Urine culture was sterile. Ultrasonogram showed a 4.5 cm irregular but well-defined hypoechoic mass protruding from the bladder wall (Fig.-1). IVU showed a filling defect at the superolateral aspect of the bladder, raising suspicion of vesical neoplasm (Fig.-2).

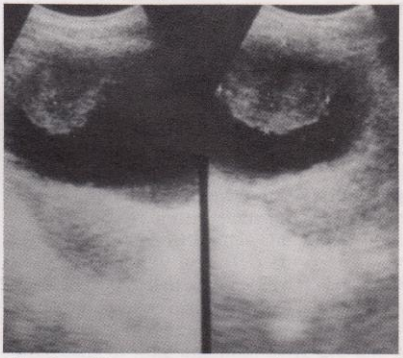

Fig.-1 : *Ultrasonogram confirmed a well-defined intravesical mass.*

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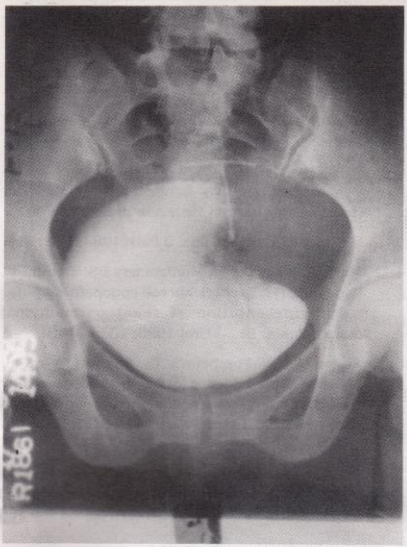

Fig.-2 : *Cystogram confirmed an intravesical filling defect.*

Through cystotomy the tumour which was adherent to the anterior abdominal wall was removed. On histopathological examination, it appeared to be an inflammatory mass that consisted mainly of sheets of histiocytes, plasma cells and neutrophilic polymorphonuclear leucocytes. Within the histiocytes, some of the blue staining oval bodies were notifed but others appeared as rather empty blue bodies and some were laminated. The later were Michaelis-Gutmann bodies (Fig.-3). These Michaelis-Gutmann bodies were diagnostic of malacoplakia. Culture of resected tissue demonstrated *E. coli*. Postoperative, the patient made an uneventful recovery.

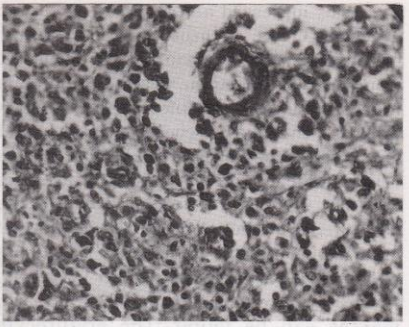

Fig. 3 : *Bladder tumour demonstrates granular histiocytes and Michaelis-Gutman bodies (H and E X40).*

Discussion :

Malacoplakia is a granulomatous inflammation currently believed to result from an inability of the host's macrophages to eliminate bacterial antigen, the most common being *E. coli*[3]. The association of *E. coli* with altered immune states is well recognized[4]. The underlying pathophysiology is thought to be due to defective intracellular destruction of phagocytosed bacteria and appears related to decreased intracellular concentration of cyclic guanosine monophosphate (CG MP)[5]. The pathognomonic Michaelis-Gutmann bodies are calcified mucopolysaccharides and lipids of similar composition as in the bacterial cell wall, especially *E. coli*, strongly suggesting the bacterial origin of the particles. These calcium containing Michaelis-Gutmann bodies can best be seen with von Kossa stain[6]. In their review of the subject, Stanton and Maxted[1] emphasized that although pathognomonic for the disease, Michaelis-Gutmann bodies may be absent in early malacoplakia and are not necessary for the diagnosis.

In the urinary tract, the ratio of females to males with malacoplakia is four to one, but this disparity does not occur in other tissues[1]. The patients often are debilitated, are

immunosuppressed and have other chronic diseases. The symptoms of bladder malacoplakia are haematuria and recurrent urinary tract infection. Cystoscopy reveals mucosal plaques or nodules. As these lesions progress, they may become fungating, and firm sessile masses that cause filling defects of the bladder, ureter or pelvis on intravenous urogram. The distal ureter may become strictured or stenotic and cause subsequent renal obstruction or non-function[7]. The more obstructive lesions can cause tiredness, weightloss, fever and night sweats. Palpable masses can be found. The erythrocyte sedimentation rate is increased; anaemia may be severe and leucocytosis is common. The lesions are detectable by gallium scintigraphy which may be an important method to determine the exact location[8,9]. Computed tomography often shows inhomogenous masses with necrosis[1]. The lesions contain bacteria, in particular *E. coli* which can be found in urine when the lesions communicate with the urinary tract. Haematogenous dissemination of *E. coli* possibly occurs from the urinary tract; a high urinary white cell count in the absence of significant bacteriuria reflecting prior antibiotic use in this case.

Diagnosis in many cases is usually made after resection. This case illustrates the diagnostic difficulties which often arise with intravesical filling defects on ultrasonogram and intravenous urogram; the diagnosis was established histologically.

Treatment of malacoplakia is treatment of the chronic bacterial infection[1]. Although multiple long-term antimicrobials have been used, substantial response with complete cure in most cases is achieved by sulfamethoxazole-trimethoprim and ciprofloxacin[10,11]. Other investigators have used ascorbic acid and cholinergic agents such as bethanecol to stimulate bactericidal activity and have reported good results[5,12,13]. Surgical intervention may, however, be necessary if the disease progress in spite of antimicrobial treatment. Recurrence following cessation of therapy is well recognized. Complete resolution necessitates an effective and prolonged therapeutic regimen with long-term follow up.

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(J Bangladesh Coll Phys Surg 1997; 15 : 43)

Continuing Medical Education :

26-9-96	-	Prof. Hasan Mohammad Khan Professor of Dermatology (Retd.) IPGMR, Dhaka Delivered lecture on "Eczema".
13-11-96	-	Major General Zia Uddin Ahmed Consultant Physician Directorate General Medical Services Ministry of Defence, Dhaka Cantt., Dhaka Delivered lecture on "Discussion on chest pain".
28-11-96	-	Prof. M. A. Mannan Miah Professor of Paediatric Haematology and Oncology IPGMR, Dhaka Delivered lecture on "Childhood malignancies".
11-12-96	-	Prof. M. N. Amin Honorary Founder Director NCHS, Mohakhali, Dhaka-1212 Delivered lecture on "Deaf child".