

# ME-JAA

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## Editorial

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### Author

**Dr Abdulrazak Abyad**

Chief editor

This is the third issue of the journal this year and is rich with various papers from around the Globe. A paper by Hoque A attempted to investigate the mortality rates by age, sex and different categories of diseases. The diseases are categorized as Micro-organism ( $C_1$ ), Un-natural ( $C_2$ ), Physiological disorder ( $C_3$ ) and Other ( $C_4$ ). The analysis shows that child and old age death rates are still high in Matlab particularly due to causes of micro-organism ( $C_1'$ ) and exogenous ( $C_1'$ ).

A retrospective study from Jordan looked at the efficacy and safety of using Mitomycin C in the management of Pterygium. The authors concluded that the use of Mitomycin C is effective in decreasing the recurrence of pterygia after excision. So it is a simple, safe and successful procedure recommended in all pterygium management.

A case control study from Iran Looked at Thyroid Dysfunction in Iranian Patients with Premature Ovarian Failure. The authors assessed 46 consecutive patients with premature ovarian failure who had no history of thyroid dysfunction and 46 normal cycling women from Taleghani Hospital, Tehran, Iran. The authors conclude that POF happened in patients who were euthyroid according to clinical and laboratory data.

Hossain M, Islam R looked at socio-demographic variables on female age at marriage in the rural area of Chorghat Thana of Rashahi districts, Bangladesh. For this a total number of 800 rural women have been interviewed through a structured questionnaire by purposive sampling technique. The study revealed that respondent's education, husband's education, respondent's father's occupation, religion and listening to the radio had highly significant effects on female age at marriage.

Ali M, Ayub S, Khan H, and Khan KM did an observational study which was conducted in the neurosurgery department Lady Reading Hospital, Peshawar following the earthquake of 8th October, 2005 in Pakistan.

A total of 49 patients were admitted to the neurosurgery department during the period immediately following the earthquake. Most of the injuries in earthquakes are unpredictable and are encountered during the initial 24-48 hours after the incident and can be managed by a well equipped unit and well prepared medical team.

A paper from Bangladesh looked at the socio-economic Conditions of Migrant's Monthly Income (Before and After Migration). Migration has long been an important livelihood strategy for the people of Bangladesh. The results showed that the effect of occupation has been found to be the strongest and educational level is the second strongest positively significant influence, for explaining the variation on monthly income for male migrants among the selected demographic and socio-economic variables in both cases. So, people migrate to new places with the hope of improving their social and economic status.

## Neurosurgical Emergencies of The October 2005 Earthquake In Pakistan At Lady Reading Hospital Peshawar

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### ABSTRACT

**Objective:** To determine the nature of neurosurgical emergencies during the earthquake of October 2005.

**Material and methods:** This was an observational study and was conducted in the neurosurgery department Lady Reading Hospital, Peshawar following the earthquake of 8th October, 2005 in Pakistan.

**Results:** A total of 49 patients were admitted to the neurosurgery department during the period immediately following the earthquake. Age range was 4-60 years and male: female ratio of 1.5:1. Thirty six patients had head injuries, 11 cases were operated on, out of which debridement and duraplasty was done in 7 cases, and the rest treated conservatively. Thirteen patients had spinal injuries; and 9 of them had D12/ L1 fractures for which transpedicular screw fixation was done. Two cases developed tetanus and two patients died.

**Conclusion:** Most of the injuries in an earthquake are unpredictable and are encountered during the initial 24-48 hours of the incident and can be managed by a well equipped unit and well prepared medical team.

**Key words:** Earthquake, Head Injuries, Spinal injury.

### Introduction

Earthquake is a natural disaster mainly affecting the mountainous zone and they strike in different parts of the world. Countries commonly affected are Japan, Iran, Turkey, Indonesia and Pakistan. No zone can be declared earthquake safe. It leads to tremendous amount of economic and human losses within no time. In the last two decades, millions of people have died and innumerable have remained handicapped due to earthquakes. Millions were severely injured on 8th October, 2005 which badly affected the mountainous zone of NWFP and Kashmir. This earthquake was more than 7 on the Richter scale. In Iran, on the 26th December 2003, an earthquake of 6.5, in Los Angeles on 17 Jan 1994 an earthquake of 6.7, and in Japan in 1995, an earthquake of 7.2, resulted in great loss of lives and economy. Earthquakes more than 6 on the Richter

scale can cause extensive damage to buildings, vehicles and roadways apart from human loss 1. The number of human casualties cannot be estimated in underdeveloped countries clearly. The major injuries are cranial followed by spinal injuries and injuries to the long bones. An estimated report from different earthquake studies shows that about 310,000 people died and millions were left destitute by the tsunami on 26th Dec, 2004. More than 43,000 died and 30,000 were injured in the city of Bam, Iran on 26th Dec 2003. About 6500 died and 34,900 were injured in Osaka Japan, on 17th Jan 1995 3. Among the injured peoples the majority were long-bone fractures, chest and spinal fractures and head injuries.

The aim of the present study was to determine the nature and extent of neurosurgical emergencies during the earthquake in Pakistan.

## Material and Methods

This study was conducted at the department of Neurosurgery PGMI Lady Reading Hospital Peshawar from the time since the earthquake of October 2005 till December 2005. About 49 patients were shifted from the earthquake zone to the department of neurosurgery Lady Reading hospital Peshawar, which is located about 200 km from the disaster zone. Emergency teams were also sent to the disaster field and a few urgent surgical procedures were performed in the field hospitals after primary trauma care. Our unit began to receive patients on the 2nd day of the disaster. Extra beds were arranged in the casualty department and the elective patients of neurosurgery unit were discharged and new elective admissions were stopped to provide beds for the earthquake victims. All diagnostic and therapeutic facilities including X-rays, CT scan (and MRI when indicated) of brain and spine were provided free of cost by the hospital.

The earthquake victims were thoroughly examined in the casualty department and then were referred to the concerned department for proper management. After management, the patients were referred to different camps in Peshawar where nursing care and rehabilitation services were already arranged.

## Results

A total of 49 patients were admitted to the neurosurgery department with an age range of 4 - 60 years; mean age was 18 years. Male: female ratio was 1.5:1 (Figure -1). There were 36 patients with head injuries (73.46%) and 13 patients (26.53%) with spinal injuries (Table-1). Three patients had scalp injuries (8.3%) and 6 patients had depressed skull fractures (16.66%). Twenty four patients had extradural haematoma (27.66%) and closed head injuries (Table-1) with and without skull fractures (66.66%) and associated limb injuries and fracture of humerus in one patient. Eleven cases were operated on and 25 were treated conservatively. Out of the operated cases, debridements and duraplasty was performed in 7 cases. Spinal injury was seen in 13 patients, 9 of them had D12 and L1 fractures and 4 had high spinal injury in the thorax (Table-1). Transpedicular fixation was done in the 9 patients who had D12 and L1 fractures and 4 patients were treated conservatively. These patients were then referred to rehabilitation centers. Out of a total of 49 patients, 2 patients died because of ventriculitis after closed head injury and two patients developed tetanus who had been operated on initially in the field of disaster (Table-2).

**Table 1.** Types of injuries treated in cases of earthquake victims in neurosurgery unit, LRH (n=49)

| Nature of injury         | Number of patients |                                |
|--------------------------|--------------------|--------------------------------|
| Head Injuries            | 36                 |                                |
| Spinal Injuries          | 13                 |                                |
| Type of Head Injury      | Number of patients |                                |
| Extradural Haematoma     | 24                 |                                |
| Depressed Skull Fracture | 8                  |                                |
| Linear Skull fracture    | 1                  |                                |
| Type of Spinal Injury    | Number of patients | Mode of Treatment              |
| D12/ L1 fracture         | 9                  | Trans-pedicular screw Fixation |

|                              |   |                        |
|------------------------------|---|------------------------|
| Thoracic/ High spinal injury | 4 | Conservative treatment |
|------------------------------|---|------------------------|

**Table 2.** Morbidity and mortality associated with head/spinal injury cases in earthquake disaster

| Morbidity/ Mortality | Number of patients |
|----------------------|--------------------|
| Tetanus              | 2                  |
| Mortality            | 2                  |

## Discussion

During the last 20 years natural disasters have claimed more than 3 million lives worldwide. These have affected at least 800 million people and has resulted in property damage which exceeds 500 billion dollars . This is because it often strikes quickly and without any warning thus its effects are unpredictable and potentially severe . Possible factors exacerbating injuries may include inability to move quickly, to avoid falling objects and to vacate buildings and decrease tolerance to injury. Entrapment in buildings and secondary disasters following earthquakes include fire, landslides, accidents and destruction of bridges and roads. These all obstruct the speedy and adequate relief of the victims and increases the death rate 6.

Catastrophes can occur anywhere at any time and the number of victims cannot be foreseen in any way. The earthquake casualties can only be reduced significantly, if it were possible to predict an earthquake.

To deal with the consequences of the earthquake disaster, the approach should be multifaceted. The government, different departments, organizations and the people at large, all should play their role with enthusiasm. The government should organize groups in different departments and NGOs who should have proper training and should be properly equipped to deal with such natural disasters.

The Medical Disaster Response, (MDR-SAVE) methodology is the systematic attempt to use Triage as a tool to maximize patient benefit in the immediate aftermath of catastrophic disaster. Medical Disaster Response projects deal with the scenario in which specially trained, local medical services providers evacuate patients immediately. The SAVE Triage was developed to direct limited resources. The SAVE assesses the solvability of patients with various injuries and describes the relationship between expected benefits and resource consumption.

## Conclusion

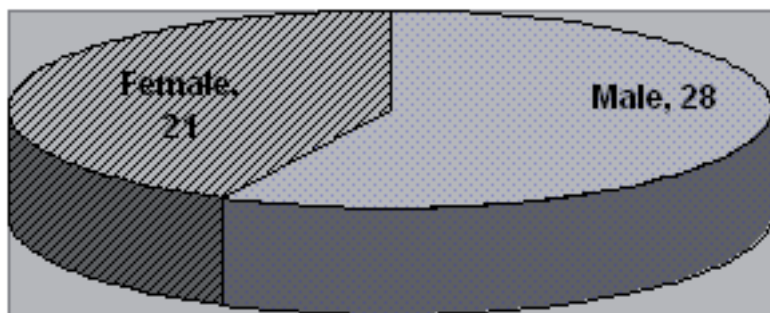
Earthquake is an unpredictable disaster which destroys buildings, houses and roads. The number of victims can not be foreseen in any way. During the initial 24-48 hour period, an excessive flow of patients will always be encountered in emergency departments; provision of suitable and sufficient medical care can only be achieved by a well prepared organization and disaster management units in hospitals

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Figure 1

### Male:Female ratio of Earthquake victims treated in neurosurgery unit, LRH (n=49)



## Factors Affecting Female Age At Marriage In A Rural Area of Charghat Thana of Rajshahi District, Bangladesh

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### ABSTRACT

The aim of this study is to identify the effects of socio-demographic variables on female age at marriage in a rural area of Charghat Thana of Rashahi districts, Bangladesh. For this a total number of 800 rural women have been interviewed through a structured questionnaire by purposive sampling technique. In this study, a logistic regression model is employed. In this analysis it is indicated that the respondent's education, husband's education, respondent's father's occupation, religion and listening to radio, have highly significant effects on female age at marriage.

**Key words:** Age at marriage, socio-demographic variables, chi-square test, logistic regression analysis, Bangladesh.

### Introduction

Bangladesh is one of the most densely populated countries in the world. Bangladesh is a small country of 147,570 square kilometers in area with a population of around 147 million people (934 people per square kilometers) (U.N, 2006) with a 150 million population in 2007 (CIA, 2007). The populations of Bangladesh are mostly poor and most of them live in rural areas. Marriage is almost universal in Bangladesh. Age at marriage, particularly among females is very low. The universality of marriage and low age at marriage is related to the religious affiliation and lower status of females in the society. Since, Muslims are a major part of the population and premarital sex is strictly prohibited in Islam, such an act is considered immoral and socially unacceptable.

According to Islamic law, marriage is an obligation for a person who has the financial ability to support his future wife or a family. Being Muslim in Bangladesh, is a major reason for ensuring early arranged marriage. Marriage squeeze appears to have been a factor in delaying marriage, especially arranged marriages, in Sri Lanka at least temporarily (Caldwell et al., 1988). In Bangladesh it seems to have led to increased instability of marriage, and more polygamy (Amin and Cain, 1997).

South Asia's marriage patterns reflect its cultural context and lesser socio-economic change but their precise effect is not simple or always predictable. In Bangladesh, age at marriage is very early and in Sri Lanka, it is much later (Caldwell and Bruce, 2005a). In contrast, early marriage and births soon after marriage are desired and common in rural Asia and North Africa. More than half the women in such areas are married by the age of 18 and births to teenage women as a percentage of all births are 11% (Alam, 2000).

Among the slum population in Dhaka generally, there are considerable advantages in early marriage, particularly in protecting young girls in a society where unmarried young women are not socially accepted, and few advantages in later marriage since there are few job opportunities in the formal sector and minimal demand for experience (Bruce and Caldwell, 2005).

The point is that with mean age at marriage rising to some adequately high level, the existing minimum age at marriage in the area will have little or no significance for fertility. In conclusion, it is necessary to integrate efforts that seek higher ages at marriage with those seeking increased spacing between births through family planning services (Chowdhury et al.,

1996). Age at marriage was positively and significantly related to the number of years of schooling the women had and to the size of the cultivated landholdings of the women's households.

The mean number of children was also positively and significantly related to the duration of marriage. The study demonstrated that age at marriage does have an effect on fertility in Bangladesh. The reduction in fertility in the village was achieved not by altering the legal minimum age for marriage but by providing and promoting increased schooling for both males and females (Khuda, 1985).

Thus, the purpose of the present work is to identify the factors affecting female age at marriage in rural areas of Charghat Thana of Rajshahi district, Bangladesh.

This paper is constructed as follow. Sources of data are included in Section 2. Section 3 contains methodology of this study. Results and discussion are narrated in Section 4. Lastly, Section 5 provides a conclusion and recommendations.

### Sources of Data

In this study, a total number of 800 female respondents were questioned during the survey period in 2007. The respondents were randomly interviewed by some selected questions from several villages in the rural area of Charghat Thana of Rajshahi district, Bangladesh by purposive sampling technique. Various socio-economic and demographic variables were considered at the time of data collection.

### Methodology

To test the association between the categorical variables bivariate analysis is used in the present study. Logistic regression analysis is carried out using the software SPSS10.0. Logistic regression is a form of regression, which is used when the dependent is a dichotomy and the independents are of any type. In logistic analysis female age at marriage is treated as a dependent variable and respondent's education, husband's education, respondent's father's occupation, respondent's occupation, husband's occupation, religion, watches TV and

listening to radio are considered as independent variables. Let Y be female age at marriage, that is a dichotomous dependent variable, which takes values 1 and 0, that is Y is classified in the following way:

It is noted that the Bangladesh Government has imposed a condition for female age at marriage of 18 years and above.

### Results and Discussions

In the present study, total 800 from 611 (76.4%) has respondent's age at marriage below 18 years or early age at marriage and mean age at marriage 16.13 years. Age at marriage varies by region, education and urban/rural residence. This is also despite the fact that Hindus now, in general, marry later than Muslims, in part because of higher education rates (Bruce and Caldwell, 2005). The illiterate and literate respondents are 60.3% and 39.7% and husband's education were 57.0% and 43.0% respectively. The respondents' highest percentage (96.5%) are engaged as housewife and (3.5%) are 'other' occupations such as services, business, job etc, and the highest percentage (76.8%) belongs to the woman whose husbands are farmers and the rest of them are engaged in other occupations such as services, business, job etc. The majority of respondents are farmer's family. In this study, most of the respondents are from the Muslim community. About 83.0% and 72.7% of rural respondents are connected to television and radio respectively.

Islam and Mahmud (1996) found that the most important factor for early female marriage were in order, female education, husband's occupation, region of residence (urban or rural), women's work status, and husband's education. In this study area, the odds ratio has age at marriage increased with an increase in educational level, with a substantial difference in the odds ratios of age at marriage between respondents who are illiterate and literate. The odds ratio regarding age at marriage of respondent,s were 2.145 times more than illiterate levels compared to literate. Education has positive significant effects on female age at marriage. Husband's education is observed to have a significant positive affect on female age at marriage in the study rural areas of Bangladesh.

**Table1:** Percent distribution of woman by age at marriage according to selected characteristics

| Characteristic                   |            | Number of the respondents | Percentage |
|----------------------------------|------------|---------------------------|------------|
| Respondent's education           | Illiterate | 482                       | 60.3       |
|                                  | Literate   | 318                       | 39.7       |
| Husband's education              | Illiterate | 456                       | 57.0       |
|                                  | Literate   | 344                       | 43.0       |
| Respondent's occupation          | Housewife  | 772                       | 96.5       |
|                                  | Others     | 28                        | 3.5        |
| Husband's occupation             | Farmers    | 614                       | 76.8       |
|                                  | Others     | 186                       | 23.2       |
| Respondent's father's occupation | Farmers    | 480                       | 60.0       |
|                                  | Others     | 320                       | 40.0       |
| Religion                         | Muslim     | 720                       | 90.0       |
|                                  | Non-Muslim | 80                        | 10.0       |
| Watches TV                       | No         | 136                       | 17.0       |
|                                  | Yes        | 664                       | 83.0       |
| Listens to Radio                 | No         | 218                       | 27.3       |
|                                  | Yes        | 582                       | 72.8       |

**Table 2:** Chi-square ( $X^2$ ) test of Age at marriage among the various socio-demographic characteristics

| Characteristics                  |            | Age at marriage |      | X <sup>2</sup> Values | Significant   |
|----------------------------------|------------|-----------------|------|-----------------------|---------------|
|                                  |            | <18             | ≥18  |                       |               |
| Respondent's education           | Illiterate | 65.8            | 42.3 | 33.188*               | Significant   |
|                                  | Literate   | 34.2            | 57.7 |                       |               |
| Husband's education              | Illiterate | 60.4            | 46.0 | 12.146*               | Significant   |
|                                  | Literate   | 39.6            | 54.0 |                       |               |
| Respondent's occupation          | Housewife  | 97.5            | 93.1 | 8.362*                | Significant   |
|                                  | Others     | 2.5             | 6.9  |                       |               |
| Husband's occupation             | Farmers    | 78.9            | 69.8 | 6.619**               | Significant   |
|                                  | Others     | 21.1            | 30.2 |                       |               |
| Respondent's Father's occupation | Farmers    | 63.3            | 49.2 | 12.013*               | Significant   |
|                                  | Others     | 36.7            | 50.8 |                       |               |
| Religion                         | Muslim     | 93.6            | 78.3 | 37.595*               | Significant   |
|                                  | Non-Muslim | 6.4             | 21.7 |                       |               |
| Watches TV                       | No         | 18.0            | 13.8 | 0.174                 | Insignificant |
|                                  | Yes        | 82.0            | 86.2 |                       |               |
| Listens to Radio                 | No         | 30.3            | 17.5 | 11.963*               | Significant   |
|                                  | Yes        | 69.7            | 82.5 |                       |               |

Notes: \*p<0.01 \*\*p<0.05 \*\*\*p<0.10

**Table 3:** Results of logistic regression analysis of Age at marriage as the dependent variable

| Characteristic                   |                  | Co-efficient () | Odds Ratio |
|----------------------------------|------------------|-----------------|------------|
| Respondent's education           | Illiterate (r.c) | -               | 1.000      |
|                                  | Literate         | .763            | 2.145*     |
| Husband's education              | Illiterate (r.c) | -               | 1.000      |
|                                  | Literate         | .420            | 1.521**    |
| Respondent's occupation          | Housewife (r.c)  | -               | 1.000      |
|                                  | Others           | .439            | 1.551      |
| Husband's occupation             | Farmers (r.c)    | -               | 1.000      |
|                                  | Others           | .147            | 1.158      |
| Respondent's father's occupation | Farmers (r.c)    | -               | 1.000      |
|                                  | Others           | .559            | 1.749*     |
| Religion                         | Muslim (r.c)     | -               | 1.000      |
|                                  | Non-Muslim       | 1.255           | 3.508*     |
| Watches TV                       | No (r.c)         | -               | 1.000      |
|                                  | Yes              | -.335           | 0.715      |
| Listening Radio                  | No (r.c)         | -               | 1.000      |
|                                  | Yes              | .964            | 2.622**    |
| Constants                        |                  | -2.638          | 0.072*     |
| -2Log likelihood: 784.021        |                  |                 |            |
| Model chi-square=90.729          |                  |                 |            |
| Degree of freedom=8              |                  |                 |            |
| R2=0.107                         |                  |                 |            |

Notes: \*p<0.01 \*\*p<0.05 r.c: reference category

The odds ratio for the respondents whose husbands have literacy 1.521, which implies that they married at higher ages compared to the respondents whose husbands were illiterate. Respondent's father's occupation is found to have a strong and positive influence on female age at marriage. The odds ratio 1.749 for the respondents whose fathers are 'other' occupations such as services, business, job etc, that there are 1.749 more likely to be married compared to farmers. Religion and media

connection have a significant influence on female age at marriage. The respondents who are connected with radio have an odds ratio 2.622 times higher to marry at later ages compared to the respondents who have no media connection.

Muslim respondents are 3.508 times less likely to have higher age at marriage than non-Muslim respondents. The other variable such as respondent's occupation,

husband's occupation and watches TV are not statistically significant effects on female age at marriage.

## Discussion

In the previous study<sup>1</sup>, the most effective antifungal agent and tissue conditioner combination and the optimum concentration were found. All treatment group combinations had greater fungicidal activity than negative controls (i.e. tissue conditioner only) and comparable inhibition diameters to positive controls (i.e. antifungal agents alone). The peak fungicidal activity was also noted.<sup>1</sup> However, there was a need to explore the long term effectiveness of the mixtures, which has not previously been investigated by other studies.

## Conclusion and Recommendation

In this study, education significantly affects female age at marriage. Mother's education was illiterate and literate are 60.3% and 39.7% respectively. And corresponding husband education were 57.0% and 43.0% respectively. The multivariate analysis shows that the risks of low age at marriage were respondent's education, husband's education, respondent's father's occupation religion and listening to radio. It is observed that the respondent's level of education is the strongest and intensive predictor of female age at marriage.

The literate respondents possess the highest female age at marriage. Hence, all out efforts should be taken to weed out female illiteracy. Initiatives must be taken to ensure their attendance in higher levels of education, and the possibility of free education for females up to university level can be justified in this context, which will accelerate the females towards higher ages at marriage in a most efficient way.

The finding of this study may have some policy implications that would help the planners and policy makers of the Government to take necessary steps in achieving female age at marriage as high as possible. The following recommendations should be suggested for policy implications:

1. Age at marriage would be increased if both mothers and husbands education are to be enhanced. As a result, rural woman could be empowered and hence, fertility and mortality would be tremendously reduced: that is our expectation. It can be suggested that male's educational facilities and attainments must be improved which will help females to be married at matured ages.
2. As a media connection has been observed to be significant on female age at marriage. Attractive and effective program/features should be telecast/broadcast/published on television/radio/newspaper, which will help in uplifting age at marriage. Attempts as well should be taken so that these arrangements may reach out to them.

The Government should consider strategies to reduce poverty, increase educational opportunity, expand schooling (particu-

larly for girls) and help to strengthen women's ability to care for their families.

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## Thyroid Dysfunction in Iranian Patients with Premature Ovarian Failure

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### ABSTRACT

**Objectives:** This study was carried out to determine the presence of thyroid dysfunction in premature ovarian failure and their relationship.

**Study Design:** In a case-control study, we assessed 46 consecutive patients with premature ovarian failure who had no history of thyroid dysfunction, and 46 normal cycling women from Taleghani Hospital, Tehran, Iran. Thyroid function tests were evaluated in both groups and results were analyzed statistically.

**Result:** Anti thyroidperoxidase and Anti thyroglobulin antibody levels were significantly higher in patients with premature ovarian failure as compared to controls. (P value = 0.02 and P value = 0.01, respectively). Thyroxine, tri-iodothyronine and thyroid stimulating hormone levels were not significantly different between patients with POF and controls.

**Conclusion:** Present study with demonstration of higher titers of anti Tg and anti TPO antibodies in Iranian patients with POF supports the autoimmune basis of disease. According to our study, POF happened in patients who were euthyroid according to clinical and laboratory data.

**Key words:** Premature Ovarian Failure, Thyroid function test, Autoimmunity, Anti Thyroidperoxidase antibody, Anti Thyroglobulin antibody.

### Introduction

Premature ovarian failure (POF) is a heterogenous syndrome defined as hypoestrogenic hypergonadotropic secondary amenorrhea that occurs in women under the age of 40 years. It is characterized by loss of oocytes, lack of folliculogenesis and ovarian estrogen production, and infertility. The incidence rate of POF is approximately 1%<sup>(1,2)</sup>. It is usually permanent, but

resumption of ovarian activity and fertility has been documented in over 50 percent of women based upon hormonal measurements<sup>(2-5)</sup>, pelvic ultrasonography<sup>(6,7)</sup>, or conception<sup>(8)</sup>. 5 - 10% of patients with POF, may subsequently experience spontaneous ovulation<sup>(1)</sup>.

The clinical picture of POF was first described in detail in 1950 by Atria<sup>(3)</sup> and De Moraes-Ruehsen and Jones in 1967 described it as non physiological cessation of

menses before the age of 40 yr<sup>(1)</sup>.

The association of POF with hypothyroidism, Addison disease, vitiligo, myasthenia gravis, Graves' disease, Sjogren syndrome, systemic lupus erythematosus, hypoparathyroidism, recurrent mucocutaneous candidiasis, celiac disease, type 1 diabetes, and rheumatoid arthritis, have been previously reported<sup>(1-7)</sup>.

Gokmen and Shah showed that thyroid dysfunction can be associated with POF. In a study done by Weyermann and his colleagues, they found that autoimmune thyroid disorder is the most common endocrine disease in their patients with POF<sup>(15)</sup>. While there were no studies on POF in our country, we conducted present study to shed more light to the problem in an Iranian population.

### Methods

This study was approved by the Institutional Review Board at Medical Science University. All women signed consent forms before participation

It has been done on 46 patients with POF who were referred to the hospital. The POF status was defined as the cessation of ovarian function for a period of > 6 months, before the age of 40 years, and Follicular Stimulating Hormone (FSH) concentration greater than 20 IU/ml detected on two different occasions. The exclusion criteria were:

1. History of ovarian surgery, radiation or chemotherapy, autoimmune diseases or metabolic disorders,
2. History of thyroid disorders or abnormal thyroid function tests,
3. Usage of drugs which may affect thyroid hormone metabolism in the past 6 months.

The controls had been picked at random, and included 46 normal cycling women attending a family planning clinic for contraception methods of intra uterine device (IUD) or tubal ligation. All the women gave written informed consent. Demographic questionnaires on age of menarche and early menopause, family history of POF, etc were completed.

Samples were saved at -20°C and done in one run. Thyroxine (T4), tri-Iodothyronine (T3), T3 resin uptake (T3RUP), and thyroid stimulating Hormone (TSH) and FSH were evaluated by using commercial radioimmunoassay kits (RIA, Pouyesh Tashkhis, Tehran, Iran). Anti TPO and Anti Tg antibodies were assessed by using commercial enzyme linked immunosorbent assay kits (ELISA, GENESIS, Cambridge Shire, CB6 ISE, UK).

SPSS Statistical programs (SPSS, software 11.0, Chicago, USA) were used to analyze results. Exact Fisher test and Chi square test were used for the comparison. P value

less than 0.05 was considered statistically significant.

### Results

**Table 1** shows the demographic data of both groups.

|                          | POF n=46  | Control n=46 |
|--------------------------|-----------|--------------|
| Age at Menarche (year)   | 12.2±2.2  | 12.7±2.5     |
| Age at Menopause (year)  | 28.9±9.1  | 49.3±4.8     |
| Parity                   | 1.29±0.8  | 2.3±1.2      |
| BMI (kg/m <sup>2</sup> ) | 26.09±4.4 | 25.1±3.6     |

Numbers are presented as mean±SD

All subjects were euthyroid. T4, T3, T3RUP and TSH levels were not significantly different between patients with POF and controls. The mean level of T4, T3, T3RUP and TSH were 9.40±2.29 (µg/dl), 1.2±0.34 (ng/ml), 28.41±1.33(%) and 2.07±1.66( m IU/ l) respectively in patients with POF. The mean level of T4, T3, T3RUP and TSH were 7.9±1.48(µg/dl), 1.2±0.32(ng/ml), 28.27±4.68(%) and 1.52±1.14( m IU/l) respectively in the controls. Anti TPO antibodies were positive in 14 out of 46 (30.4%) patients with POF, compared to 4 out of 46 (8.6%) controls. Anti Tg antibodies were positive in 22 out of 46 (48%) of patients with POF, compared to 9 out of 46 (19.5%) controls. Anti TPO and Anti Tg levels were significantly high in patients with POF compared to controls. (P value = 0.02 and P value = 0.01, respectively) (Table2).

**Table 2.** Positive Anti thyroid antibodies in POF and control groups

| Antibodies | POF(n=46)      | Control(n=46) | Odds Ratio*  |
|------------|----------------|---------------|--------------|
| P value    | Positive value |               |              |
| Anti TPO   | 30.4%(n=14)    | 8.6%(n=4)     | 3.9(1.3-5.2) |
| 0.02       | > 75 (IU / ml) |               |              |
| Anti Tg    | 48%(n=22)      | 19.5%(n=9)    | 3.1(1.1-4.9) |
| 0.01       | >100 (IU/ml)   |               |              |

\* Confidence Interval(95%)

### Discussions

We found a higher frequency of anti TPO and anti Tg antibodies in patients with POF in comparison to controls. This study showed that premature ovarian failure can be associated with presence of anti-thyroid peroxidase and anti thyroglobulin antibodies.

There were no cases of hypo or hyperthyroidism in patients with POF. These findings are in favour of autoimmunity as a possible mechanism in pathogenesis of POF. The association between premature ovarian failure and thyroid dysfunction has been discussed before, but in our study presence of anti thyroid antibodies happened in patients who were euthyroid.

Gokmen et al showed significant difference in TSH

levels between his patients and control groups<sup>(12)</sup>, that is different from our findings, but they had not excluded all the known thyroid dysfunction cases. Betterle et al, in a descriptive study showed that 10% of patients with POF had anti thyroid antibodies. However, that study didn't have any control group<sup>(13)</sup>.

Goswami supported our results by showing higher frequency of anti TPO antibodies in patients with POF in comparison to controls<sup>(7)</sup>. Shah and colleagues studied 37 Indian patients with POF, and reported 22% prevalence of thyroid dysfunction. They reported that hypothyroidism was the most common coexistent thyroid disorder in patients with POF<sup>(14)</sup>.

In a study which was done by Weyermann and colleagues, they found that autoimmune thyroid disorder is the most common endocrine disease in their patients and they recommended measurement of TSH as a screening test for thyroid dysfunction in patients with POF<sup>(15)</sup>.

According to our study, we advise measurement of thyroid function tests in patients with POF. Accepting the concept that POF is a heterogeneous disorder in which some of the idiopathic forms are based on an abnormal self-recognition by the immune system will lead to new approaches in the treatment of reproductive problems and infertility in these patients.

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## A Comparative Study of the Levels of Mortality by Causes of Death in a Rural Population of Bangladesh

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### ABSTRACT

The present study is an attempt to investigate the mortality rates by age, sex and different categories of diseases. The diseases are categorized as Micro-organism ( $C_1$ ), Un-natural ( $C_2$ ), Physiological disorder ( $C_3$ ) and Other ( $C_4$ ). and also as Endogenous ( $C'_1$ ), Exogenous ( $C'_2$ ) and other ( $C'_3$ ) and depending on age, the stages of life are categorized as Infant (<1 year), Children (1-4 years), Youth age group (5-19 years), Most productive age group (20-44 years), Older productive age group (45-64 years) and Old age group (65+ years). The analysis shows that child and old age death rates are still high in Matlab particularly due to causes of micro-organism ( $C_1$ ) and exogenous ( $C'_1$ ).

**Key Words:** Mortality Rate, Diseases, Endogenous, Exogenous, Productive Age

### Introduction

Cause-specific mortality statistics are primary evidence for health policy formulation, programme evaluation, and epidemiological research (Seval Akgün et al., 2007). Study of the trends in mortality by causes of death in Bangladesh is scarce due to paucity of relevant data.

Data on mortality by age, sex and cause are primary inputs for assessing population health status, and a cornerstone of the evidence base for health policy, in combination with other epidemiological and socio-economic information. While medically certified cause of death data from complete civil registration systems is the 'gold standard' for such statistics, these are generally not available in over two-thirds of all countries (Mathers et al., 2005). Currently, several critical mortality indicators (e.g. infant, child and maternal mortality rates) are estimated using data from demographic surveys.

While trends in these indicators do suggest improvements in maternal and child health over the past three decades, they are prone to measurement error, due to sampling as well as recall bias. Even if the levels and

trends were reliably estimated, further improvements in population health would require accurate information on cause-specific mortality to guide policy and programme priorities (Ruzicka et al., 1990).

Persons dying of different causes are not recorded on a national basis therefore it is very difficult to obtain cause-specific death statistics for the population of the country. Death statistics by various causes are recorded, perhaps only for Matlab population under the Demographic Surveillance System (DSS) undertaken by ICDDR, B.

The present study was carried out with an objective of investigating the trend in the level of mortality by various types of causes of death and stages of life, in the population of Matlab, a rural population of the country.

### Data and Methodology

The present study has utilized published data on mortality of Matlab population in Chandpur district, Bangladesh. The Scientific Reports of ICDDR, B publish statistics on births, deaths, migration and marriage of the DSS, Matlab. The mortality data are published by age

and sex and also by causes of death. Our present study uses causes-specific, age and sex data from the years 1980 and 1987. Such data are available in the Scientific Report No.70 published in 1992 (ICDDR, B 1992). Quite a good number of causes of death (in terms of disease) prevail in Bangladesh as well as in Matlab. The Scientific Reports of DSS of the year 1980 recorded 27 diseases, and 21 diseases in 1987. For the sake of analysis the age groups are classified on the basis of Spengler and Duncan (1963) classification which we call stages of life. These are as follows:

Under 1 (one) year: Infant  
 1-4 years: Children  
 5-19 years: Youth age group  
 20-44 years: Most productive age group  
 45-64 years: Older productive age group  
 65+ years: Old age

However, such a classification of life cycle is arbitrary but we believe that prevalence of disease and incidence of death due to various diseases can well be represented by such a classification of life stages.

The causes of death are grouped into the following categories with the relevant disease.

Category I: Micro-organism (Labelled as  $C_1$ ): Measles, tetanus, diarrhoea (acute, chronic), dysentery (acute, chronic), jaundice, tuberculosis, venereal disease, cholera (proved), rheumatism, ENT disease other infectious disease, ARI (pneumonia, influenza), etc.

Category II: Unnatural Death (Labelled as  $C_2$ ): Drowning, murder, suicide, homicide, accident etc.

Category III: Physiological Disorder (Labelled as  $C_3$ ): Disease of GI tract, respiratory, malignant neoplasms, COPD, gastrointestinal, dropsy, vascular (heart and liver) disease senility (old diseases ) etc.

Category IV: Other (labelled as  $C_4$ ): Skin disease, childbirth (direct obstetric), nutritional, fever (all forms), unknown and other.

In analyzing mortality in terms of cause of death in detail it is useful to distinguish the broad classes of disease designated as endogenous and exogenous (Siegel and Sryock, 1976). Thus on the basis of our data and nature of diseases the total causes are again categorized into three categories. They are as follows with the relevant disease:

Category I: Endogenous (Labelled as  $C'_1$ ): Malignant neoplasms (cancer), disease of G.I. tract, cardiovascular (heart & liver) diseases, gastrointestinal, childbirth (direct obstetric), skin disease, dropsy, rheumatism,

senility (old age), COPD (Chronic, Obstructive, Pulmonary Disease).

Category II: Endogenous (Labelled as  $C'_2$ ): Diarrhoea (acute, chronic), dysentery (acute, chronic), tuberculosis, tetanus, measles, venereal disease, drowning, murder, suicide, homicide, accident, cholera (proved), jaundice, respiratory, fever (all forms), ENT disease, other infectious and ARI (pneumonia, influenza), etc.

Category III: Other (Labelled as  $C'_3$ ): Nutritional, unknown and other.

The analysis is performed following the stages of life and various categories of disease as described above.

In order to get a clearer picture of the prevalence of mortality due to various categories of diseases at different stages of life, we need to compute the cause and life stage specific mortality rates for the study population. Such rates are computed (Johnson et al., 1980) in the following way,

$$M_{is} = (D_{is} / P_s) \times 1000$$

Where  $M_{is}$  is the observed mortality rate due to  $i$ 'th category of disease at the stages of life  $S$ . Here  $D_{is}$  denotes observed deaths due to  $i$ 'th category of disease at the  $S$ th stage of life out of the exposure population  $P_s$  in that stage of life.

For infant stage,

$$M_{is} = (D_{is} / B) \times 1000$$

Where  $B$  is the total births born alive and  $S$  indicates the infant stage of life.

## Results

Table 1 presents the mortality rates due to various categories of diseases viz,  $C_1$ (micro-organism ),  $C_2$ (unnatural death),  $C_3$ (Physiological disorder) and  $C_4$ (other ) and also for all causes ( $C$ ) at different stages of life as indicated in the table for males and females of Matlab DSS population for the years 1980 and 1987.

The data shows that infant mortality rates (IMR) due to all causes ( $C$ ) for male, female and both sexes respectively are 90.3, 118.5 and 103.9 per 1000 live births in 1980 whereas the respective figures are 90.3, 83.1 and 86.7 in 1987. Marked difference is evident in male-female IMR in both the year of 1980 and 1987 with a sharp decline in female IMR in 1987. Except that of child stage of life mortality rates due to all disease, all other stages have not shown any virtual temporal variation. Table 1 further shows high infant mortality rate is due

to category  $C_1$  (micro-organism) and is 59.8 in 1980 and 79.0 in 1987 followed by cause  $C_4$  (other) which is 23.4 in 1980 and 9.4 in 1987. It is also found that rates of male death have increased in 1987 in comparison to micro-organism and unnatural causes in 1980, but the female infants death rates have declined in 1987 with respect to all categories of disease except the cause of unnatural death.

The infant female mortality rates in 1980 are 69.4, 1.7, 9.8 and 37.6 due to categories of  $C_1$ ,  $C_2$ ,  $C_3$  and  $C_4$  respectively. Whereas the corresponding figures in 1987 are 67.7, 2.8, 8 and 1.8 respectively. The child mortality rates decline in 1987 compared to 1980 due to all categories of causes, except cause  $C_2$  (unnatural cause of death) for male, female and both sexes.

The child mortality rates are 6.2, 14.2 and 10.1 for male, female and both sexes respectively due to micro-organism cause in 1980. Such rates in 1987 are 5.3, 11.8 and 8.4 respectively. The corresponding figures due to causes of unnatural death are 2.5, 2.1 and 2.3 in 1980 and 2.3, 2.5 and 2.4 in 1987. For cause physiological disorder ( $C_3$ ) the respective results are 2.5, 5.4 and 3.9 in 1980 and 4.1, 0.5 and 0.3 in 1987. It has also been found from Table 1 that female child mortality rate due to every category of diseases are higher than male child mortality rates in both the years 1980 and 1987. The highest male child mortality is 6.2 in 1980 due to cause  $C_1$  and 5.3 in 1987 due to the same cause  $C_1$  and the lowest figure are 2.5 in 1980 and 0.1 in 1987 both due to cause  $C_3$ . The highest female child mortality rate is 14.2 in 1980 and 11.8 in 1987 for cause  $C_1$ .

From Table 1 it has been found that mortality rates in youth and most productive age groups by sex, have declined slightly in 1987 from 1980, due to all categories of disease except category  $C_2$ . Mortality rates for both stages of life are slightly increased in 1987 than in 1980 for female and both sexes for the causes  $C_2$ . The youth male mortality rate is higher due to cause  $C_1$  than all other causes in 1980 whereas that in 1987 was due to cause  $C_4$ . On the other hand the highest youth female mortality rate is 0.9 in 1987 due to cause  $C_4$ . The highest male rate of most productive age group is 1.2 in 1980 due to cause  $C_3$  and 0.9 in 1987 due to cause  $C_4$ . and the highest female rate of most productive age group is 1.4 in 1980 and 1.9 in 1987 due to other causes.

In oldest productive age group and oldest age group the male mortality rates are 14.5 and 69.8 respectively due to all causes in 1980 and the corresponding figures are 16.0 and 75.6 in 1987. Thus the male mortality rates of oldest productive and old age groups have increased in 1987 in comparison to 1980. However for females the corresponding mortality rates are 13.16 and 72.1 in

1980 and 13.2 and 74.2 in 1987 for both sexes. All other categories also show the same trend except cause  $C_2$  for oldest productive age and cause  $C_3$  of old age group. The oldest productive death rates due to causes  $C_2$  are approximately the same in 1980 and 1987, and older death rates for female and both sexes have decreased at all categories of causes, except category  $C_2$  in 1987 compared to 1980.

The overall death rates are 12.1, 14.1 and 13.1 of male, female and both sexes respectively in 1980 and the corresponding figures in 1987 are 10.2, 10.3 and 10.2 implying the death rates have declined in 1987 compared to 1980.

Mortality rate due to endogenous, exogenous and other categories of disease of group two at different stages of life for males, females and both sexes together for the years 1980 and 1987, are presented in Table 2.

It is found from this Table that the infant mortality rates of male, female and both sexes are 3.2, 3.9 and 3.5 respectively in 1980 and 0.6, 0.8 and 0.7 in 1987 indicating a declining tendency over time. No sex differential in IMR due to endogenous cause is apparent. In cases of exogenous cause the male IMR has increased from 69.5 in 1980 to 80.4 in 1987. The female IMR has shown the reverse trend; it has decreased from 86.7 in 1980 to 70.5 in 1987. Infant mortality rates due to exogenous causes for both the sexes are higher than that of endogenous causes and other causes. Such a trend is apparent in both the years.

Child mortality rates due to both the sexes and different categories  $C_i$  ( $i=1, 2, 3$ ) of diseases of group two are higher in 1980 than in 1987. Child mortality rates for different categories are higher for females than that for males for both the years 1980 and 1987.

Youth and most productive mortality rates for male, female and both sexes for all of categories of diseases remain almost the same but with a slightly decline tendency in 1987 compared to 1980. Mortality rates at the oldest productive, and old age groups, have shown an increasing tendency for causes categorized as endogenous ( $C_1$ ) and, group other a decline tendency over time for cause exogenous ( $C_2$ ). The phenomena are evident in both the sexes.

Thus our impression is that the diseases categorized as exogenous are more prominent in Matlab in comparison to diseases categorized as endogenous and others, at least at the infant, and old stages of life. Children of 1 to 4 years of age also die in good numbers due to this exogenous cause. However, decreasing trends in death rates by cause is apparent in almost all stages of life.

**Conclusion**

Of all causes of death that prevail in Matlab deaths due to the cause of micro-organisms are substantial compared to other categories of diseases at least among the infants and children. This is also the case in the exogenous category of diseases. Both the categories consist of mostly communicable and water-borne diseases. Prevention and control of such disease largely depends on the improvement of health and sanitation conditions. Temporal trend in the level of mortality by various categories of diseases and at different stages of life cycle reflects a somewhat improved health care system in Matlab. The impression is that much care still needs to be taken for further improvement of the environment condition related to health in this area in particular, and in the country, in general.

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**Table 1.** Mortality Rates due to Group One Categories of Diseases at Different Stages of Life: Mis; i=1, 2, 3, 4. [Matlab population,1980 and 1987]

| Mortality rates per 1000(Mis) |        |               |      |           |      |           |      |           |      |           |      |
|-------------------------------|--------|---------------|------|-----------|------|-----------|------|-----------|------|-----------|------|
| Stages life                   | Sex    | All causes(C) |      | 1st cause |      | 2nd cause |      | 3rd cause |      | 4th cause |      |
|                               |        | 1980          | 1987 | 1980      | 1987 | 1980      | 1987 | 1980      | 1987 | 1980      | 1987 |
| Infant <1                     | Male   | 90.3          | 90.3 | 58.9      | 79.0 | 0.0       | 1.4  | 7.9       | 0.6  | 23.4      | 9.4  |
|                               | Female | 118.5         | 83.1 | 69.4      | 67.7 | 1.8       | 2.8  | 9.8       | 0.8  | 37.6      | 11.8 |
|                               | Both   | 103.9         | 86.7 | 64.0      | 73.4 | 0.8       | 2.1  | 8.8       | 0.7  | 30.3      | 10.6 |
| Child 1-4                     | Male   | 16.5          | 8.7  | 6.2       | 5.3  | 2.5       | 2.3  | 2.5       | 0.1  | 5.4       | 1.1  |
|                               | Female | 28.0          | 16.7 | 14.2      | 11.8 | 2.1       | 2.5  | 5.4       | 0.5  | 6.4       | 1.9  |
|                               | Both   | 22.1          | 12.6 | 10.1      | 8.4  | 2.3       | 2.4  | 3.9       | 0.3  | 5.9       | 1.5  |
| Youth 5-19                    | Male   | 1.6           | 1.5  | 0.7       | 0.5  | 0.2       | 0.4  | 0.2       | 0.2  | 0.6       | 0.7  |
|                               | Female | 2.2           | 1.7  | 0.8       | 0.5  | 0.1       | 0.1  | 0.4       | 0.1  | 0.9       | 0.9  |
|                               | Both   | 1.9           | 1.6  | 0.7       | 0.5  | 0.2       | 0.3  | 0.3       | 0.1  | 0.7       | 0.7  |
| Most Productive 20-44         | Male   | 2.9           | 1.7  | 0.5       | 0.3  | 0.2       | 0.4  | 1.2       | 0.3  | 0.9       | 0.7  |
|                               | Female | 2.9           | 3.0  | 0.7       | 0.3  | 0.1       | 0.3  | 0.8       | 0.5  | 1.4       | 1.9  |
|                               | Both   | 2.9           | 2.4  | 0.6       | 0.3  | 0.1       | 0.3  | 1.0       | 0.4  | 1.2       | 1.3  |
| Older Pro-ductive 45-64       | Male   | 14.5          | 16.0 | 2.9       | 2.1  | 0.5       | 0.6  | 6.8       | 6.3  | 4.7       | 7.0  |
|                               | Female | 13.2          | 10.4 | 3.7       | 1.9  | 0.0       | 0.1  | 5.4       | 4.8  | 4.1       | 3.6  |
|                               | Both   | 14.0          | 13.2 | 3.3       | 2.0  | 0.3       | 0.3  | 6.1       | 5.5  | 4.4       | 5.3  |
| Old age 65+                   | Male   | 69.8          | 75.6 | 18.9      | 6.9  | 1.1       | 0.8  | 36.7      | 61.5 | 13.1      | 6.4  |
|                               | Female | 75.0          | 72.6 | 17.4      | 7.2  | 1.3       | 0.6  | 42.2      | 54.2 | 14.2      | 6.6  |
|                               | Both   | 72.1          | 74.2 | 18.2      | 7.1  | 1.2       | 0.7  | 39.2      | 60.0 | 13.6      | 6.5  |
| Total                         | Male   | 12.1          | 10.2 | 4.8       | 4.8  | 0.6       | 0.7  | 3.4       | 3.3  | 3.3       | 1.9  |
|                               | Female | 14.1          | 10.3 | 6.1       | 4.6  | 0.4       | 0.6  | 3.6       | 2.8  | 4.1       | 2.3  |
|                               | Both   | 13.1          | 10.2 | 5.4       | 4.5  | 0.5       | 0.6  | 3.5       | 3.0  | 3.7       | 2.1  |

**Table:2.** Mortality Rates (M/i; i=1,2,3) due to group two categories of diseases (C/i; i=1,2,3) at indicated stages of life: Matlab population, 1980 and 1987.

| Mortality Rates Per 1000       |        |                  |      |                  |      |              |      |
|--------------------------------|--------|------------------|------|------------------|------|--------------|------|
| Stages of life                 | Sex    | Endogenous cause |      | Exogenous causes |      | Other causes |      |
|                                |        | 1980             | 1987 | 1980             | 1987 | 1980         | 1987 |
| Infant<br><1                   | Male   | 3.2              | 0.6  | 69.4             | 17.6 | 9.4          | 9.4  |
|                                | Female | 3.9              | 0.8  | 86.7             | 27.9 | 11.8         | 11.8 |
|                                | Both   | 3.5              | 0.7  | 77.8             | 22.6 | 10.2         | 10.2 |
| Child<br>1-4                   | Male   | 1.6              | 0.1  | 12.7             | 2.3  | 1.1          | 1.1  |
|                                | Female | 4.0              | 0.5  | 20.8             | 3.2  | 1.9          | 1.9  |
|                                | Both   | 2.8              | 0.3  | 16.6             | 2.7  | 1.5          | 1.5  |
| Youth<br>5-19                  | Male   | 0.2              | 0.2  | 1.1              | 0.3  | 0.4          | 0.4  |
|                                | Female | 0.5              | 0.2  | 1.3              | 0.4  | 0.8          | 0.8  |
|                                | Both   | 0.4              | 0.2  | 1.2              | 0.4  | 0.6          | 0.6  |
| Most<br>Productive<br>20-44    | Male   | 1.1              | 0.3  | 1.1              | 0.7  | 0.7          | 0.7  |
|                                | Female | 1.0              | 1.0  | 1.3              | 0.7  | 1.4          | 1.5  |
|                                | Both   | 1.0              | 0.7  | 1.2              | 0.7  | 1.1          | 1.1  |
| Older Produc-<br>tive<br>45-64 | Male   | 5.3              | 6.3  | 7.0              | 2.5  | 7.0          | 7.0  |
|                                | Female | 5.4              | 4.8  | 5.7              | 2.1  | 3.6          | 3.6  |
|                                | Both   | 5.3              | 5.5  | 6.4              | 2.3  | 5.3          | 5.3  |
| Old age<br>65+                 | Male   | 35.4             | 61.5 | 26.1             | 8.3  | 6.4          | 6.4  |
|                                | Female | 43.4             | 58.2 | 24.8             | 6.8  | 6.6          | 6.6  |
|                                | Both   | 39.0             | 60.0 | 25.5             | 7.6  | 6.5          | 6.5  |
| Total                          | Male   | 2.8              | 3.3  | 7.2              | 2.1  | 1.9          | 1.9  |
|                                | Female | 3.3              | 3.0  | 8.4              | 2.3  | 2.1          | 2.1  |
|                                | Both   | 3.1              | 3.1  | 7.8              | 2.2  | 2.0          | 2.0  |

## **Study of the Socio-economic Conditions of Migrant's Monthly Income (before and after migration): An Application of Multiple Classification Analysis (MCA)**

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### **ABSTRACT**

Migration has long been an important livelihood strategy for the people of Bangladesh. Choice of destination and levels of benefits and risks, however, vary significantly, according to the economic and social power of the migrant. The aim of this study is to identify the various influential factors on monthly income of male migrants. Therefore, the data of this study was collected from 420 respondents by purposive sampling technique and interview method in Chapai-Nawabgonj Pourasava, Bangladesh. Multiple Classification Analysis (MCA) has been used in this study. It was observed that people migrate to certain places due to economic reasons and to improve their life style. The results showed that the effect of occupation has been found to be the strongest factor and educational level is the second strongest and is a positively significant influence for explaining the variation on monthly income for male migrants among the selected demographic and socio-economic variables in both cases. So, people migrate to new places with the hope of improving their social and economic status.

**Key Words:** Socio-economic and demographic variables of Migrants, Multiple Classification Analysis (MCA), Bangladesh.

### **Introduction**

Migration is the third basic factor affecting change in the population of an area: the other two factors are births and deaths. The importance of migration in affecting the growth and decline of populations and in modifying the demographic characteristics of the areas of origin and the areas of destination has long been recognized. It is also an important element in the growth of population and the labor force of an area. It has long been an important livelihood strategy for the people of Bangladesh. Whenever the population rose to such an extent that people could no longer secure a livelihood, they are obliged to migrate elsewhere. Even today, both poor and better off people pursue migration as a livelihood strategy in Bangladesh.

demography both in the number of ways it is manifested and defined. Two crucial dimensions of migration are space and time. In order to separate migration from other spatial movement, operational definitions invariably set lower limits. The most frequently imposed lower limits are geo-political boundaries. Moves within prescribed boundaries are not migration while moves across boundaries are. These boundaries are often chosen as proxies for spatial distance.

However, very long distance moves may fall within established boundaries. Short distance moves may involve crossing national boundaries.

Migration is a form of geographical or spatial mobility involving a change of usual residence between clearly defined geographical units. According to the UN Multilingual Demographic Dictionary "Migration is

Migration stands out among the fundamental topics of

a form of geographical mobility or spatial mobility between one geographic unit and another generally involving a change in residence from the place of origin or place of departure to the place of destination or place of arrival”.

Johnston et al (2000:504) define migration as permanent or semi-permanent change of residence by an individual or group of people. Migration means physical movement of people from one place to another for the betterment of life. Rural-urban migration is the migration of people from rural areas into cities. It is one of the vital events that alter the size of the population of sub-regions in a country.

Migration can occur as result of push and pull factors. Push factors are those, which force a person to move. These can include drought, famine, lack of jobs, over population and civil war. Pull factors are those, which encourage a person to move to leave the place of origin. These include a chance of a better job, better education, better standard of living, good physical facilities etc. Furthermore, urban pull factors - conditions encouraging people to move to the cities - tend to be similar worldwide, and include prospects of earning higher wages, a perceived demand for labor and better social services. Push factors - conditions encouraging people to leave the origin - vary considerably among regions and countries, as well as among social groups, and between men and women.

No one will ordinarily like to leave the place of his birth; friends as well as kind, unless that is absolutely necessary. Some factors influence the causes which affect the migration such as- Economic factors, Geographical factors, Social factors, Demographic factors, Political factors, Religious factors, Industrialization.

Many studies have been carried out on migration by individuals as well as by organizations. They studied migration pattern and socio-economic structure in different times. Recent research strongly emphasizes the role of social contacts, social networks, and social capital in perpetuating the flow of migration within spatial settings, social groupings, or identity groups (Massey et al., 1987; Boyd, 1989; Portes and Bach, 1985; Shah, 1998).

People migrated to cities and towns because they are attracted by livelihood opportunities. Studies on migration have established a positive association between levels of infrastructural development of a region and the magnitude of out-migration (CUS, 1990). Regardless of skill, the migrated population can find diversified livelihood opportunities with various incomes in the towns and cities.

Therefore the main objectives of this study are:

- i) to study the living status, that is, the socio-economic and demographic characteristics of the migrants and
- ii) to assess the contribution of some demographic and socio-economic factors on monthly income before and after migration, for male migrants.

This paper is structured as follows: Sources of data are included in section 2. Section 3 contains methodology of this study. Results and discussion are described in Section 4. Section 5 provides the conclusion and lastly, recommendations are in Section 6.

## Data and Methodology

### Sources of Data

To fulfill the aforementioned objectives, the data of this study was collected from the Poursava of Chapai-Nawabganj district of Bangladesh by purposive sampling technique and direct interview method. The socio-economic and demographic characteristics are considered at the time of data collection.

### Methodology of this Study

In 1934, Yates developed the multiple classification analysis (MCA). It was later expanded and detailed by Anderson and Bancroft in 1952. In 1963, the computerized MCA programme was prepared by a group of researchers at the Survey Research Center of the University of Michigan. Multiple classification analysis requires one dependent variable and two or more independent variables. The dependent variable can be either a continuous or a categorical variable but all the independent variables must be categorical variable.

The MCA model can be written as

$$Y_{ijk} = \bar{y} + a_i + b_j + c_k + \dots + e_{ij}$$

Where,  $Y_{ijk}$  = The value or score on the dependent variable

$\bar{y}$  = Grand mean of the dependent variable

$a_i$  = The effect of the membership in the  $i$ th category of predictor A

$b_j$  = The effect of the membership in the  $j$ th category of predictor B

$c_k$  = The effect of the membership in the  $k$ th category of predictor C

$e_{ijk}$  = The error term related with  $Y_{ijk}$  score of the individuals

In this model, monthly income (before and after migration) is considered as a dependent variable and age, religion, education, occupation, type of family and number of family members are treated as independent

variables.

## Results and Discussion

Age is the most important variable not only in the study of demographic analysis but also in social research. It was found from Table 1 that maximum number of migrants has age more than 35 that is 68.5%. It noticed that 86.2% migrants are Muslims and 13.8% are Non-Muslims. It was also found that 19% completed secondary education and 80.2% had higher secondary and above education. The occupation established that 57.4% of migrants had involved in service and 32.1% had engaged in business and the rest being in another category. Most of the migrants, 81% and 19%, had lived with a single and joint family respectively. It also observed that 82.6% and 15% of migrants had been living with less than 4 and 4-5 family members respectively.

In this research, we investigated the intensity of influence of all explanatory variables with our selected dependent variable in different cases. For this investigation, Multiple Classification Analysis (MCA) is used, which is made for the contribution of independent variables with our selected dependent variables. The dependent variables are monthly income of migrants before and after migration. Age, an important factor, influences on monthly income.

Before migration, a migrant's age belongs to the age between 30 to 35 years which we have adjusted as mean of monthly income at TK. 10235.79. The results show that migrants who belong to the age interval 30 to 35 years have higher monthly income than migrant's age that belong to less than 30 years and more than 35 years respectively. It is found that the monthly income for Muslims and Non-Muslims family has a very small difference.

The adjusted mean of monthly income of migrants who have attained more than higher secondary education is TK. 10111.46. It is observed that monthly income of higher secondary and above is more than that of other categories of education. The adjusted mean of monthly income for service, business and other occupations are TK. 9295.26, TK. 11465.14, and TK. 8613.43 respectively. It is seen that monthly income is higher for those who are engaged in business.

It shows that monthly incomes of single family and joint family are not much difference. The adjusted mean of monthly income is TK. 9955.60 for those who have less than four family members.

The proportion of variance of monthly income explained by occupation is the highest (unadjusted value,  $\eta^2=0.259$  and adjusted value,  $\beta^2=0.266$ ) among all other variables while the proportion of variance explained by type of family is the lowest (unadjusted value,  $\eta^2=0.035$

and adjusted value,  $\beta^2=0.001$ ). It is observed that the significance of educational level has been found to be the second strongest influence for explaining the variations on monthly income among the included variables in the case of before migration. The proportion of variance explained by migrant's education is  $\eta^2=0.086$  and  $\beta^2=0.092$ .

Education of migrants has directly affected monthly income. The indirect effects of education on monthly income through occupation and numbers of family members are 0.100 and 0.001 respectively. Occupation has a direct affect on monthly income. Migrant's age has the direct effect on monthly income and also has an indirect effect through occupation, at 0.058. Migrant's age and occupation has a positive association. Type of family is directly affected on monthly income.

Again in the case of after migration, migrants age belonging to the age between 30 to 35 years, have a mean adjusted monthly income of TK. 10189.24. We detect that the mean adjusted monthly incomes are TK. 9987.49 and TK. 9868.18 for Muslim family and Non-Muslim family respectively. Migrants who have achieved more than higher secondary education have a mean adjusted monthly income of TK. 10155.47.

Occupation is an important factor that affects monthly income of migrants. It is found that those who are engaged in business have the highest adjusted mean of monthly income of TK. 11465.14. Among the socio economic factors, type of family is another influential factor that is differentiating migration.

The adjusted mean of monthly incomes are TK. 9921.30 and TK.10180.59 who are living in a single and joint family, correspondingly. The mean adjusted monthly income is TK. 10030.45 for those who has less than four family members. On the other hand, the adjusted mean of monthly incomes are TK. 9676.57 and TK. 9644.47 for families that have four to five and more than five family members respectively.

The proportion of variance in monthly income explained by occupation is the highest (unadjusted value,  $\eta^2=0.262$  and adjusted value,  $\beta^2=0.269$ ) among all other variables while the proportion of variance explained by type of family is the lowest (unadjusted value,  $\eta^2=0.013$  and adjusted value,  $\beta^2=0.025$ ). Educational level is found to have a very strong and positive influence on migration. The strength in explaining the variability by this variable is  $\eta^2=0.091$  and  $\beta^2=0.091$ .

In this study there are various variables that have a direct and indirect effect on monthly income. Educational level has been found to be one of the strongest factors that

have a direct and indirect effect on migrant's monthly income. Education has indirect consequences on monthly income through occupation status and numbers of family members are 0.1014 and 0.0022 correspondingly. Migrant's age has a direct effect on monthly income. The indirect effect on monthly income through occupation is 0.0584.

Type of family is one of the influential factors on monthly income. It has a direct influence on monthly income. The indirect influence of type of family on monthly income through occupation and numbers of family member are 0.0078 and 0.0012 respectively.

### **Conclusion**

Migration is an important factor to change the population of a region or a country. In MCA, the result suggests that occupation of male migrants has found to be the first strongest influential factor for explaining the variation of monthly income both before and after migration. On the other hand, educational level of male migrants also has the second strongest factor.

The MCA result shows that grand average monthly income of a migrant is TK. 9650.84 before migration and TK. 9678.13 after migration. So, a migrant's income level has increased after migration.

The fact shows that the academic qualifications of the migrants have a positive factor for the increase of salary structure after migration. It is taken to be the strongest factor. The MCA result shows that migrant's occupation is a positive factor for explaining the variation of monthly salary structure.

Before migration, a migrant earned mean adjusted TK. 11465.14 per month. But after migration, the migrant's income reached mean adjusted TK. 11505.81 per month and the income is getting reached gradually.

These migrants are doing business. Migrants have to migrate to improve their life status. So they are obliged to migrate to earn money. It is noted that the variation of monthly income (before and after migration) could not be shown actually due to lack of proper information of income. It is tradition that none can provide actual information of income.

### **Recommendation**

Bangladesh is characterized by rapid urbanization, backed by a huge base population with accelerated growth rate. So, it is very difficult to give any solution to reduce this problem. The following policies are suggested in the present study:

i) Government should adopt decentralized policies and

programmers to create employment opportunities in the rural areas to reduce unemployment and hence rural to urban migration might be discouraged. Consequently, the pressure of urbanization should be abated.

- ii) Government may invest resources for the improvement of rural economies through different rural development projects and by creating job opportunities in the rural areas.
- iii) Alleviate urban poverty by income-enhancing methods, improve productivity of the informal sector. The role of NGOs should be encouraged and enhance their activities at grass root levels in rural areas of Bangladesh.

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**Table 1** Distribution of migrants based on socio-economic and demographic characteristics

| Name of variable         | Number of migrants | Percentage (%) |
|--------------------------|--------------------|----------------|
| Migrant's age:           |                    |                |
| <30                      | 52                 | 12.3           |
| 30-35                    | 76                 | 19.2           |
| 35+                      | 292                | 68.5           |
| Religion:                |                    |                |
| Muslims                  | 362                | 86.2           |
| Non-Muslim               | 58                 | 13.8           |
| Educational level:       |                    |                |
| Primary                  | 3                  | 0.7            |
| Secondary                | 80                 | 19.0           |
| Higher Secondary & above | 337                | 80.2           |
| Occupation:              |                    |                |
| Service                  | 241                | 57.4           |
| Business                 | 135                | 32.1           |
| Others                   | 43                 | 10.5           |
| Type of family:          |                    |                |
| single family            | 340                | 81.0           |
| joint family             | 80                 | 19.0           |
| Number of family member: |                    |                |
| <4                       | 347                | 82.6           |
| 4-5                      | 63                 | 15.0           |
| 5+                       | 10                 | 2.4            |

**Table 2** Results of MCA of monthly income of migrant's before migration

| Explanatory variable      | Predicted Mean |          | Correlation ratio        |                         |
|---------------------------|----------------|----------|--------------------------|-------------------------|
|                           | Unadjusted     | Adjusted | $\eta^2$<br>(Unadjusted) | $\beta^2$<br>(Adjusted) |
| Migrant's age             |                |          | 0.054                    | 0.053                   |
| < 30                      | 9107.14        | 9210.73  |                          |                         |
| 30-35                     | 10000.00       | 10235.79 |                          |                         |
| 35+                       | 9981.90        | 9939.71  |                          |                         |
| Religion                  |                |          | 0.042                    | 0.004                   |
| Muslim                    | 9856.06        | 9931.46  |                          |                         |
| Non-Muslim                | 10344.8276     | 9883.32  |                          |                         |
| Educational qualification |                |          | 0.086                    | 0.092                   |
| Primary                   | 8333.33        | 9575.14  |                          |                         |
| Secondary                 | 9280.00        | 9167.41  |                          |                         |
| Higher secondary & above  | 10095.45       | 10111.46 |                          |                         |
| Occupation                |                |          | 0.259                    | 0.266                   |
| Service                   | 9457.56        | 9295.26  |                          |                         |
| Business                  | 11338.35       | 11465.14 |                          |                         |
| Others                    | 8095.24        | 8613.43  |                          |                         |
| Type of family            |                |          | 0.035                    | 0.001                   |
| Single Family             | 9993.71        | 9923.64  |                          |                         |
| Joint Family              | 9632.91        | 9929.19  |                          |                         |
| Number of family members  |                |          | 0.041                    | 0.017                   |
| <4                        | 9960.47        | 9955.60  |                          |                         |
| 4-5                       | 9883.33        | 9773.99  |                          |                         |
| 5+                        | 8833.33        | 9748.10  |                          |                         |

**Table 3** Zero-order correlation coefficient of monthly income before migration by selected demographic and socio-economic variables

|                | Y     | X <sub>1</sub> | X <sub>2</sub> | X <sub>3</sub> | X <sub>4</sub> | X <sub>5</sub> | X <sub>6</sub> | X <sub>7</sub> |
|----------------|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Y              | 1.000 | 0.043          | -0.085         | 0.042          | 0.142**        | -0.025         | -0.035         | 0.039          |
| X <sub>1</sub> |       | 1.000          | -0.260**       | 0.128**        | -0.149**       | 0.217**        | 0.185**        | 0.383**        |
| X <sub>2</sub> |       |                | 1.000          | -0.052         | -0.090         | 0.181**        | -0.016         | 0.040          |
| X <sub>3</sub> |       |                |                | 1.000          | 0.138**        | 0.029          | 0.052          | -0.005         |
| X <sub>4</sub> |       |                |                |                | 1.000          | -0.377**       | -0.041         | -0.065         |

|                |  |  |  |  |  |       |        |        |
|----------------|--|--|--|--|--|-------|--------|--------|
| X <sub>5</sub> |  |  |  |  |  | 1.000 | -0.029 | 0.118* |
| X <sub>6</sub> |  |  |  |  |  |       | 1.000  | 0.035  |
| X <sub>7</sub> |  |  |  |  |  |       |        | 1.000  |

\*\*Correlation is significant at the 0.01 level, \* Correlation is significant at the 0.05 level

- Y= Monthly income
- X<sub>1</sub> =Migrant's age
- X<sub>2</sub> =Marital status
- X<sub>3</sub> =Religion
- X<sub>4</sub> =Educational level
- X<sub>5</sub> =Occupation
- X<sub>6</sub> =Type of family
- X<sub>7</sub> =Number of family members

**Table 4** Mean number of monthly income for male after migration by some selected demographic and socioeconomic variables using MCA

| Explanatory variable       | Predicted Mean |          | Correlation ratio |                |
|----------------------------|----------------|----------|-------------------|----------------|
|                            | Unadjusted     | Adjusted | η <sup>2</sup>    | β <sup>2</sup> |
| Migrant's age:             |                |          |                   |                |
| < 30                       | 9107.14        | 9223.19  | 0.057             | 0.052          |
| 30-35                      | 10000.00       | 10189.24 |                   |                |
| 35+                        | 10038.17       | 10001.68 |                   |                |
| Religion:                  |                |          |                   |                |
| Muslim                     | 9909.83        | 9987.49  | 0.037             | 0.010          |
| Non-Muslim                 | 10344.83       | 9868.18  |                   |                |
| Educational qualification: |                |          |                   |                |
| Primary                    | 8333.33        | 9583.70  | 0.091             | 0.091          |
| Secondary                  | 9280.00        | 9221.12  |                   |                |
| Higher secondary & above   | 10152.57       | 10155.47 |                   |                |
| Occupation:                |                |          |                   |                |
| Service                    | 9545.80        | 9370.25  | 0.262             | 0.269          |
| Business                   | 11358.21       | 11505.81 |                   |                |
| Others                     | 7952.38        | 8476.23  |                   |                |
| Type of Family:            |                |          |                   |                |
| Single Family              | 9996.72        | 9921.30  | 0.013             | 0.025          |
| Joint Family               | 9860.76        | 10180.56 |                   |                |
| Number of family members:  |                |          |                   |                |
| <4                         | 10033.04       | 10030.45 | 0.047             | 0.033          |
| 4-5                        | 9783.33        | 9676.57  |                   |                |
| 5+                         | 8833.33        | 9644.47  |                   |                |

**Table 5** Zero-order correlation coefficient of monthly income after migration by selected some demographic and socio-economic variables

|                |       |                |                |                |                |                |                |                |
|----------------|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                | Y     | X <sub>1</sub> | X <sub>2</sub> | X <sub>3</sub> | X <sub>4</sub> | X <sub>5</sub> | X <sub>6</sub> | X <sub>7</sub> |
| Y              | 1.000 | 0.037          | -0.085         | 0.037          | 0.128**        | -0.041         | -0.013         | 0.037          |
| X <sub>1</sub> |       | 1.000          | -0.260**       | 0.128**        | -0.149**       | 0.217**        | 0.185**        | 0.383**        |
| X <sub>2</sub> |       |                | 1.000          | -0.052         | -0.090         | 0.181**        | -0.016         | 0.040          |
| X <sub>3</sub> |       |                |                | 1.000          | 0.138**        | 0.029          | 0.052          | -0.005         |
| X <sub>4</sub> |       |                |                |                | 1.000          | -0.377**       | -0.041         | -0.065         |
| X <sub>5</sub> |       |                |                |                |                | 1.000          | -0.029         | 0.118*         |
| X <sub>6</sub> |       |                |                |                |                |                | 1.000          | 0.035          |
| X <sub>7</sub> |       |                |                |                |                |                |                | 1.000          |

\*\* Correlation is significant at the 0.01 level, \* Correlation is significant at the 0.05 level

- Y= Monthly income
- X<sub>1</sub> =Migrant's age
- X<sub>2</sub> =Marital status
- X<sub>3</sub> =Religion
- X<sub>4</sub> =Educational level
- X<sub>5</sub> =Occupation
- X<sub>6</sub> =Type of family
- X<sub>7</sub> =Number of family members

## Efficacy of Mitomycin C in Pterygium Management

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### ABSTRACT

**Aims:** To determine the efficacy and safety of using Mitomycin C in the management of pterygium.

**Methods:** A retrospective study of 37 eyes (30 patients), with the mean age of 43 years (30 -55 years) attending the ophthalmology clinic. 17 eyes (17 patients) were treated by using Mitomycin C; 14 eyes had primary pterygia and 3 eyes with recurrent pterygia. 20 eyes (13 patients) were treated without use of Mitomycin C; 15 eyes had primary pterygia and 5 eyes had recurrent pterygia. All eyes received the same medications postoperatively.

**Results:** In the Mitomycin C treated eyes, we noted that only 2 eyes (11.7%) had recurrent pterygia, after 14 months follow-up, but the recurrence in the non-Mitomycin C group was higher than that of the Mitomycin group; with 9 eyes (45%) having recurrence after the same period of follow-up. Also we noted that the healing of conjunctiva was delayed when we used Mitomycin C in comparison to the other group; which is a known side effect of Mitomycin C.

**Conclusion:** From these results we conclude that the use of Mitomycin C in the management of pterygium is effective in decreasing the recurrence of pterygia after excision. So it is a simple, safe and successful procedure that we recommend in all pterygium management.

**Keywords:**  $I_2$  (Survivors at Age 2) Values for male and female Population of Bangladesh Modeling Cross-validity prediction power (CVPP) F-test

### Introduction

A pterygium is an abnormal (non-cancerous) growth of the conjunctiva; a triangular fibrovascular sub-epithelial ingrowth of degenerative bulbar conjunctival tissue over the limbal onto the cornea<sup>(1)</sup>. The conjunctiva is a thin membrane lining the inside of the eyelid and part of the eyeball (located between the sclera, or the "white of the eye") which surrounds the eyeball.

Excessive growth of the conjunctiva leads to a pterygium, which appears as a fleshy spot. Pterygia are nearly always preceded and accompanied by pingueculae<sup>(2)</sup>.

The exact cause of pterygium is unknown. The most common factors that contribute to pterygium include:

### Excessive exposure to sunlight

Sex: Male

Increasing age

Working outdoors

Excessive exposure to harsh environmental conditions such as dust, dirt, heat, wind, dryness, and smoke

Excessive exposure to allergens such as industrial solvents and chemicals.

The symptoms of pterygia include the following: redness, irritation, tearing, foreign body sensation, dryness, sometime blurring of vision especially when it causes corneal astigmatism<sup>(1)</sup>.

Management of pterygium can be divided into

### Observation:

\* Periodic eye examination, usually when the pterygium causes no or minimal symptoms

- \* If symptoms increase, additional treatments may include:
  - Medications: prescription antibiotics to prevent infection; corticosteroids to reduce inflammation; ocular lubricants
  - Radiation therapy to stop pterygium cells from reforming<sup>(7)</sup>.
  - Mitomycin C to aid in healing and prevent recurrence<sup>(8)</sup>.

### **Surgery**

Indications for pterygium excision include<sup>(12)</sup>: persistent discomfort, vision distortion, and restricted ocular motility. Microsurgical excision of a pterygium aims to achieve a normal, topographically smooth ocular surface<sup>(3)</sup>.

Mitomycin (Mitomycin C; MMC) is an antibiotic isolated from *Streptomyces caespitosus*. The drug is a bioreductive alkylating agent that undergoes metabolic reductive activation, and has various oxygen tension-dependent cytotoxic effects on cells, including the cross-linking of DNA. It is widely used systemically for the treatment of malignancies, and has gained popularity as topical adjunctive therapy in ocular and adnexal surgery over the past 2 decades<sup>(6)</sup>. Its use has been described in the management of ocular surface neoplasias<sup>(4)</sup>, conjunctival malignant melanoma and primary acquired melanosis with atypia<sup>(5)</sup>, and in conjunctival intraepithelial neoplasia<sup>(10)</sup>.

Complications of topical Mitomycin C have been described in the literature and include the following: scleral necrosis and thinning, perforation, endophthalmitis, endothelial decompensation, glaucoma, and iritis<sup>(9)</sup>.

### **Materials and Methods**

A retrospective study of 37 eyes (30 patients), with the mean age of 43 years (30 -55) years attending the ophthalmology clinic.

We divided the patients into two main groups; in the first group we use Mitomycin C, and in the second we only excised the pterygium.

17 eyes (17 patients) were treated by using Mitomycin C; 14 eyes had primary pterygia and 3 eyes with recurrent pterygia. 20 eyes (13 patients) were treated without the use of Mitomycin C; 15 eyes had primary pterygia and 5 eyes had recurrent pterygia. All eyes received the same medications postoperatively.

The examination included:

- \* Visual Acuity-a test to measure the patient's ability to see and read the smallest letters on an eye chart (by using Topcon chart projector (vision tester VT-SE; Topcon Co, Japan) with E letters at a distance of 6 meters.
- \* Slit Lamp Examination-a bright light with magnification used to view the eye.
- \* Photo Documentation-Photography to record the degree of growth of a pterygium.

The cornea and conjunctiva were examined by using binocular slit lamp microscope with magnification, and we chose the patient who had pterygium indicated for surgical excision (a condition that causes one of these; visual impairment, persistent discomfort, and restriction of ocular motility).

We excluded from this study; pingueculae, simple pterygia that cause no or minimal symptoms.

In this study we applied 0.4 mg/ml Mitomycin C intraoperatively for 3 minutes following pterygium excision.

### **Results**

Of the 37 eyes (30 patients); had Mitomycin C treated eyes (17 eyes). We noted that only 2 eyes (11.7% ) had recurrent pterygia, after 14 months follow-up (see Table 1), but the recurrence in the non-Mitomycin C group (20 eyes) was higher than that of the Mitomycin group 9 eyes (45%) after the same period of follow-up (see Table 2). Also we noted that the healing of conjunctiva was delayed when we use Mitomycin C in comparison to the other group; which is a known side effect of Mitomycin C; and it is not a significant complication because we use it in a minimal dose for a short period of time.

The postoperative recurrent pterygia in the Mitomycin C group were not from the primary pterygia, but only from the recurrent pterygia (preoperative). The recurrent pterygia in the non-Mitomycin C group were from both primary and recurrent pterygia.

### **Conclusion**

Pterygium is a common disorder affecting conjunctiva and cornea especially in hot and dry environmental areas. It is insignificant when it is simple and not causing discomfort to the patient and does not need aggressive management except observation and some medications such as antibiotics to prevent the infections; corticosteroids to reduce inflammation; and ocular lubricants.

Pterygium is significant when it causes patients discomfort (persistent), visual impairment, and restriction of ocular motility. These are indications for excision of pterygium which can be either excision alone or excision

along with adjunctive therapy such as Mitomycin C, 5 fluorouracil, etc.

The former has had a high recurrence rate which is annoying for the patient.

In this study we use Mitomycin C intra-operative with the excision, and we follow-up these patients, with good results. Recurrence of pterygia was decreased and there were minimal complications. From these results we recommend the use of Mitomycin C in pterygium management because it is a simple, safe, and successful procedure.

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**Table 1** Recurrent rate in Mitomycin Group

|                | Pre-op.        |           | Post-op. |           |
|----------------|----------------|-----------|----------|-----------|
|                | Primary        | Recurrent | Primary  | Recurrent |
| Males          | 9              | 2         | 0        | 1         |
| Females        | 5              | 1         | 0        | 1         |
| Total          | 14             | 3         | 0        | 2         |
| Recurrent rate | 2 eyes (11.7%) |           |          |           |

**Table 2** Recurrent rate in Nonmitomycin Group

|                | Pre-op.      |           | Post-op. |           |
|----------------|--------------|-----------|----------|-----------|
|                | Primary      | Recurrent | Primary  | Recurrent |
| Males          | 10           | 3         | 2        | 3         |
| Females        | 5            | 2         | 1        | 3         |
| Total          | 15           | 5         | 3        | 6         |
| Recurrent rate | 9 eyes (45%) |           |          |           |