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Prevalence of Pterygium in Imphal, Manipur and its Associated Risk Factors.

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ABSTRACT

Background: The prevalence of pterygium varies widely across the globe implying various risk factors which are region-specific. Hardly any data is available about the north-eastern part of India. Objectives: To find out the prevalence of pterygium and also to determine its associated risk factors in the central part of Manipur state. **Methods:** A cross-sectional community-based study was conducted in May-Sept 2015 in ten randomly selected residential areas of Imphal East and Imphal West districts of Manipur. 1200 randomly selected eligible adults aged 20 years or more were interviewed for their background socio-economic characteristics and other potential risk factors of pterygium and later a comprehensive eye examination was done. **Results:** The prevalence of pterygium was found to be 12.5%. It was more among the younger age group (p=0.001), those working outdoors (p=0.001) and those belonging to low income group (p=0.001). It was found to be equally distributed among the two sexes and also among tobacco smokers and non-smokers. Milder forms of the disease were found among low income groups and non-smokers whereas severer forms were found among people who worked outdoors. **Conclusion:** The relationship between pterygium and outdoor activity was reaffirmed from the current study findings.

Keywords: Prevalence, Pterygium, Risk factors, Vision.

INTRODUCTION

Described as an "Ophthalmic Enigma" pterygium is a wing-shaped, fibro-vascular growth of the bulbar conjunctiva and is of great concern to both surgeons and patients as it has been shown to recur in up-to 97% of patients within one year of surgical removal.[1,2] Population-based studies demonstrate region-dependent prevalence rates, ranging from 1.2% among Caucasian population to 36.6% among Indians of the Brazilian rain forest.[3-12]

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Some studies have shown the positive correlation between certain risk factors including ultraviolet-B irradiation and formation of pterygium.[13-16] The influence of these risk factors may vary from region to region. Hardly any literature exists for such studies conducted in the north-eastern part of India. Hence it was felt important to take up an epidemiological study on pterygium in this part of the country.

Objectives:

The current study was conducted to find out the prevalence of pterygium and also to determine the associated risk factors among adults in the central part of Manipur state.

MATERIALS AND METHODS

A cross-sectional community-based survey was conducted during May-Sept 2015 in Imphal East and Imphal West districts of Manipur. Ten municipality wards/villages from all the existing residential areas were randomly selected from the list available in Census 2011 report. The study population consisted of all adults aged 20 years and above in these ten selected residential areas. Those who were very sick or refused to participate in the study or not contactable even on second visit were excluded from the study.

After obtaining informed verbal consent a standardized interview schedule having sections on potential risk factors of pterygium like background socio-demographic characteristics, medical history for diabetes, hypertension etc., tobacco/ alcohol-use, occupation and type of work-place was administered to the study participants. After the interview each participant received a comprehensive vision and eye examination. Corrected and uncorrected visual acuity was recorded by using illuminated Snellen's Chart at six meters for each eye. The anterior segment of the ocular surface was examined for

evidence of pterygium by means of a portable hand-held slit lamp.

A pterygium was operationally defined as a radially-oriented fibro-vascular lesion crossing the nasal or temporal limbus and was graded clinically by slit-lamp examination as Grade 1 (atrophic and transparent), Grade 2 (intermediate) and Grade 3 (fleshy and opaque).

Data obtained were entered and analyzed by using SPSSv.20. Both descriptive statistics (mean, standard deviation and percentages) and analytical statistics (chi square test and its modification) were used for data analysis. A p-value of less than 0.05 was taken as significant.

RESULTS

A total of 1551 adults were found to be eligible for the study out of which 1200 participated in the study giving a participation rate of 77.36%. The non-responders were mostly people who had occupation-related commitments. The mean age (SD) of the study participants included in the study was 41.16 (±10.6) years. There were 564 males (47%) and 636 females (53%). The socio-demographic characteristics of the study participants were as given in [Table 1].

Pterygium in both or either one of the eyes was found in 150 study participants giving a prevalence rate of 12.5%. The prevalence of pterygium was analyzed against their background characteristics [Table 2].

Table 1: Sex-wise socio-demographic characteristics of the study participants (n=1200).

Socio-demographic characteristics	Males (% of total)	Females (% of total)	Total (%)
Age- group (in year)			
• 20-29	84 (50.0)	84 (50.0)	168
• 30-39	198 (48.5)	210 (51.5)	408
• 40-49	174 (48.3)	186 (51.7)	360
• 50 and above	108 (40.9)	156 (59.1)	264
Tobacco smoking habit	348 (61.1)	222 (38.9)	570
• Smoker	216 (34.3)	414 (65.7)	630
• Non-smoker			
Work-place	348 (61.1)	222 (38.9)	570
• Primarily outdoor	216 (34.3)	414 (65.7)	630
• Primarily indoor			
Income (in Rs. per month)	216 (51.4)	204 (48.6)	420
• < 5,000	192 (45.1)	234 (54.9)	426
• 5,000-15,000	156 (44.1)	198 (55.9)	354
• > 15,000			

Table 2: Study participants with pterygium by background characteristics.

Background characteristics	Pterygium cases (%)	P value
Age groups		
• 20-29	30 (17.86)	0.001
• 30-39	60 (14.71)	
• 40-49	48 (13.00)	
• 50 and above	12 (4.55)	
Sex		
• Male	72 (12.77)	0.39
• Female	78 (12.27)	
Work-place		
• Primarily outdoor	114 (32.76)	0.001
• Primarily indoor	36 (16.67)	
Income (in Rs. per month)		
• < 5,000	72 (17.14)	0.001
• 5,000-15,000	54 (12.69)	
• > 15,000	24 (6.78)	
Tobacco smoking		
• Smoker	72 (12.63)	0.34
• Non-smoker	78 (12.38)	

The prevalence rate of pterygium was found to be lower as the age of the study participant increased. This difference was found to be statistically significant (p=0.001). There was no difference in the prevalence between the two sexes. Pterygium was found to be more prevalent among those who worked outside compared to those who worked inside. This difference was found to be statistically significant (p=0.001). Pterygium was also found to be more among low income group of less than Rs. 5,000/- per month when compared to higher income groups (p=0.001). There was no statistically significant difference in the prevalence between the smokers and non-smokers.

Out of those 150 study participants having pterygium 54 (36%) were of Grade 1, 78 (52%) were of Grade 2 and the remaining 18 (12%) were of Grade 3 (Table 3). Grade 2 pterygium lesions were the commonest across all age-groups followed by Grade 1 lesions. Each half of study participants aged 50 years and above had Grade 2 or Grade 3 lesions.
Both male and female patients had comparable proportion of the different grades of pterygium lesions. People who worked outdoors were more likely to have more severe form of the disease. Regarding income, milder grades of the disease was found to be more among those who earned less than Rs. 5,000/- per month whereas Grade 3 lesions were found more commonly in the higher income groups. Grade 1 lesions were found more predominantly among non-smokers whereas severer lesions were found more among the smokers.

Table 3: Background characteristics of pterygium patients by grade of pterygium lesion.

Background characteristics	Grade of pterygium lesions		
	Grade 1 (%)	Grade 2 (%)	Grade 3 (%)
Age groups			
• 20-29	12 (40.0)	18 (60.0)	-
• 30-39	24 (40.0)	36 (60.0)	-
• 40-49	18 (37.5)	18 (37.5)	12 (25.0)
• 50 and above	-	6 (50.0)	6 (50.0)
Sex			
• Male	24 (33.0)	42 (58.0)	6 (9.0)
• Female	30 (38.5)	36 (46.2)	12 (15.3)
Work-place			
• Primarily outdoor	36 (31.6)	60 (52.6)	18 (15.8)
• Primarily indoor	18 (50.0)	18 (50.0)	-
Income (in Rs. per month)			
• < 5,000	42 (58.3)	24 (33.3)	6 (8.4)
• 5,000-15,000	6 (11.1)	42 (77.8)	6 (11.1)
• > 15,000	6 (25.0)	12 (50.0)	6 (25.0)
Tobacco smoking			
• Smoker	18 (25.0)	42 (58.3)	12 (16.7)
• Non-smoker	36 (46.2)	36 (46.2)	6 (7.6)

The grading of the pterygium lesions was also analyzed according to the side of the lesion in the eye. Majority of the temporal side lesions were Grade 1 lesions (63.2%) whereas majority of the nasal side lesions were Grade 2 lesions (54.0%). Grade 3 lesions were found exclusively among those who had nasal-side lesions.

DISCUSSION

The current study showed a high prevalence rate of pterygium in the central part of Manipur state (12.5%). This was on the higher side if compared to study findings made by other researchers. Many researchers are of the opinion that the prevalence of pterygium vary widely with race, age, sex and geographical location.[7,10,12]
In the current study, pterygium was more commonly found in the age-group of 20-29 years. Previous studies showed an increasing trend of the disease among the aged people.[9,10,12] The difference may be explained by the difference in the timing of the studies, the race and the location of the study setting.
No sex-wise difference in the occurrence of pterygium could be detected from the current study. Earlier studies recorded higher prevalence among the males.[8,10,15] Again this may be explained by the difference in the timing of the studies, the race, participation rates of different sexes and the location of the study setting.

Luthra R et al found that the blacks in Barbados, which lies in the tropics, 13º north of the equator had very high rates of pterygium (23.4%) whereas very low prevalence rates were found by Wong TY et al among the Chinese Singaporeans (6.9%) and by Mc Carty CA et al among white people in temperate rural Australia (6.7%).[6-8] These may reflect variations between study populations, differences in outdoor activity and resultantly differences in sun-exposure. Direct comparisons of prevalence rates between different studies need to be made with caution as there are potential differences in the operational definition used, varying age composition of the study population, measurement techniques used and the study methodology adopted.
The pathogenesis of pterygium is associated with p53 oncogene expression,[17,21] fibroblast transformation,[18] alterations in cytokines and matrix metalloproteinase activity.[19,20] Ultraviolet light exposure has been implicated in p53 mutagenesis.[21] The current study finding of significant correlation with outdoor activity supports this fact.
Other population-based surveys which showed high prevalence rates of pterygium are Meiktila Eye Study and the Barbados Eye Study.[22.6] Outdoor lifestyle and genetic susceptibility were implicated for the later study finding. The current study finding of greater correlation with outdoor activity is in consistence with the long-held belief that UV irradiation plays a role in the pathogenesis of

pterygium. This finding is corroborated with other study findings, too.[23-26]

CONCLUSION

The current study is the first of its kind in the state of Manipur. Although the sample size used was small, it reaffirmed the relation of the disease with outdoor activity which is a modifiable risk factor. Further epidemiological studies with bigger sample sizes aimed at establishing relationship with other potential risk factors including genetic predisposition are recommended.

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