

PREVALENCE OF PTERYGIUM AMONG KITCHEN STAFF IN SENIOR HIGH SCHOOLS IN THE KUMASI METROPOLIS, GHANA

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ABSTRACT

The purpose of the study was to determine the prevalence of pterygium and the risk factors prevailing at the work environments of the kitchen staff in some Senior High Schools (SHS) in the Kumasi Metropolis. A total of 290 kitchen staff and 120 administrative staff (control) were purposively sampled from the 13 SHSs in the Kumasi Metropolis and screened for the presence of pterygium. The risk factors in the work environments were also identified. The prevalence of pterygium stood at 31.0%, with itchy eyes, redness and tearing as the disturbing symptoms of those identified as having pterygium in the kitchen staff and 5.0% for the control group. A total of 22 (35.0%) respondents (kitchen staff) aged 51-60 years and 11 (20.4%) of those aged 21-30 years had pterygium. There was a significant difference in the observed prevalence's. However there was no significant difference in the prevalence of pterygium depending on the years worked as a kitchen staff. There is a high prevalence (31.0%) of pterygium among kitchen staff in the SHSs in the Kumasi Metropolis. Smoke, fumes from slicing onions, gender and heat (high temperatures) were identified as risk factors for the development of pterygium and other ocular conditions among the kitchen staff.

INTRODUCTION

Pterygium is a wing like fibro vascular growth of the bulbar conjunctiva and underlying sub-conjunctival tissue of the interpalpebral fissure that may encroach onto the cornea (Jaros and DeLuise, 1988). Histologically, pterygium consists of a core of denatured collagen surrounded by lymphocytes and plasma cells (Cameron, 1983). The mechanism of pterygium formation is not yet fully understood; however, some research data have provided evidence implicating genetic components in the pathogenesis of the disease (Chen *et al.*, 1994). Its

growth has been attributed partially to exposure to the elements, especially to ultraviolet (UV) light (Moran *et al.*, 1984). Pterygium is a cause of concern for both the patient because of its unsightly appearance and surgeons because of its tendency to recur. The postoperative recurrences are so common after pterygium surgery and are supposed to occur secondary to production of angiogenic factor released by polymorphonuclear leukocytes stimulated by surgical insult (Agarwal *et al.*, 2002). Pterygium is a disfiguring disease that can potentially lead to blindness; complex surgery may be required to

restore vision in advanced stages (Solomon *et al.*, 2001).

In general pterygium is more prevalent in tropical and subtropical areas, where the residents have high levels of sunlight exposure (Nakaishi *et al.*, 1997). Pterygium has been considered as a significant public health problem in rural areas primarily due to ocular exposure to the sun (McCarthy *et al.*, 2000). In previous studies on general populations, the prevalence of pterygium was 17% in residents on a tropical island in Indonesia (Tan *et al.*, 2006) and as high as 31.06% in Lima, Peru (Rojas and Malaga, 1986). Previously reported prevalence rates of pterygia vary widely with race, age, sex and geography (Panchapakesan *et al.*, 1998; Saw *et al.*, 1999; Wong *et al.*, 2001).

Work environment has been one of the risk factors to the development of pterygium especially where there is exposure to dust, sunshine (ultraviolet radiation) and high temperatures. Brine workers have a higher risk of developing pterygium probably due to their exposure to sunlight reflected both from the surface of brine and from the surface of salt crystals (Mathur *et al.*, 2006). Pang (2006) and Saw *et al.*, (2000) in other studies have identified other risk factors as wind, heat dryness and smoke/smoking for pterygium development.

This study aims at describing the prevalence and to identify the associated risk factors of pterygium among kitchen staff of some Senior High Schools in the Kumasi metropolis.

MATERIALS AND METHODS

The study recruited 290 kitchen staff and a con-

trol group of 120 administrative staff from 13 Senior High Schools with boarding facilities in the Kumasi metropolis. The schools were purposively sampled, with all the target staff available at the time of the study examined.

Each participant's eye was examined and also interviewed. The standard questionnaire used included information on personal and family health history among others. The eye examination included the inspection of the anterior segment, using the Welch Allyn Ophthalmoscope. During the interview, the respondents were asked about previous surgical removal of pterygium.

The diagnosis of pterygium was defined as any extension of the conjunctiva onto the clear cornea (Lin *et al.*, 2006). A subject was diagnosed as 'positive' if at least one pterygium lesion was observed in either eye (Gazzard *et al.*, 2002).

RESULTS AND DISCUSSION

Out of the 290 kitchen staff who participated in the study, 66 (22.8%) were males and 244 (77.2%) females. Age of respondents ranged from 21 to 60 years with a mean age of 41.37 (SD=9.79). The modal age was 36 years. The age range amongst the control group, 120 administrative staff, ranged from 21-60 years. A total of 56 (46.7%) were males and 64 (53.3%) were females. The mean age was 40.75 (SD=2.04) and modal age 41 years. The gender and age characteristics of respondents are shown in Table 1.

Table 1: Age and gender distribution of respondents

Age Group	Gender (Study Group) (N=290)			Gender (Control Group) (N=120)		
	Male (%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
21-30	21 (7.2)	33 (11.4)	54 (18.6)	9 (7.5)	7 (5.8)	16 (13.3)
31-40	20 (6.9)	62 (21.4)	82 (28.3)	25 (20.8)	18 (15.0)	43 (35.8)
41-50	18 (6.2)	74 (25.5)	92 (31.7)	15 (12.5)	28 (23.3)	43 (35.8)
51-60	7 (2.4)	55 (19.0)	62 (21.4)	7 (5.8)	11 (9.2)	18 (15.0)
Total	66 (22.8)	224 (77.2)	290(100.0)	56 (46.7)	64 (53.3)	120(100.0)

The respondents complained of several symptoms which may have no association with the development of pterygium. However, for those who had pterygium 70% complained of gritty feeling while 76.7% complained of burning/stinging sensation. Interestingly, all (100.0%) of the staff with pterygium had red and itchy eyes.

Ninety (31.0%) of the respondents had pterygium (unilateral or bilateral). This prevalence is quite high. However, pterygium prevalence has not been previously documented in the country. The prevalence of pterygium in this study (31.0%) is higher than the prevalence of 8.8% reported by Meseret *et al.* (2008) in Ethiopia. Out of the 90 pterygium cases presented, 69 (23.8%) were women while 21 (7.2%) were males. Thus prevalence rate amongst females as observed in this study was more than three times that in males (7.2%) (Table 2). However, previous studies have shown that occurrence of pterygia in males was twice that in females (Fisher *et al.*, 2009). Reports on whether gender is related to pterygium have been debated. Lu *et al.* (2007) found a statistically significant difference in pterygia occurrence between men and women with women having a higher risk than men (OR 1.5; 95% CI 1.2- 2.0). This is consistent with work done by Wu *et al.* (2002) and Liu *et al.* (2001) in China. Higher prevalences amongst females in our study may be as a result of the differences in lifestyles of females compared to males. Additionally, in many African countries, women are the cooks in their homes and thus these women are likely

to continue cooking for their families at home after the normal cooking work in the schools kitchen thus exposing them to more heat and smoke.

Considering the various age groups, the age group 51-60 had significantly ($p < 0.05$) higher percentage of pterygium cases (35.5%) compared to the 21-30 age group (20.4%). Previous studies have shown that it is uncommon for patients to present with pterygia prior to age 20 years. However, patients older than 40 years have the highest prevalence of pterygia, while patients aged 20-40 years are reported to have the highest incidence of pterygia (Fisher *et al.*, 2009). Pterygium is rare before the age of 15 years. The prevalence of the lesion increases with age (Mvogoet *et al.*, 1995; Wong *et al.*, 2001). In our study, the prevalence of pterygium in the over 40 years of age is higher (18.3%) than those below the age of 40 years (12.8%). This is consistent with results of other studies (Leske, 2001; Bueno-Gimeno *et al.*, 2002).

In the control group, only five (4.2%) of the respondents had pterygium (unilateral or bilateral) which was far below the prevalence of 31.0% in the study group. Of the 5 pterygia cases in the control group, 4 (3.33%) were females and 1 (0.8%) a male (Table 2).

Respondents who had worked between 11 to 15 years seemed to have had the highest (39.1%) prevalence of pterygium, however, there were no significant differences ($p > 0.05$) in prevalence with respect to the number of years worked as kitchen staff. Thus, the development

Table 2: Percentage prevalence of Pterygium by age and sex in respondents

Age Group	Gender (Study Group)			Gender (Control Group)		
	Male (%)	Female (%)	Total (%) (N=290)	Male (%)	Female (%)	Total (%) (N=120)
21-30	3 (1.0)	8 (2.8)	11 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)
31-40	8 (2.8)	18 (6.2)	26 (9.0)	0 (0.0)	0 (0.0)	0 (0.0)
41-50	6 (2.1)	25 (8.6)	31 (10.7)	0 (0.0)	2 (1.7)	2 (1.7)
51-60	4 (1.4)	18 (6.2)	22 (7.6)	1 (0.8)	2 (1.7)	3 (2.5)
Total	21 (7.2)	69 (23.8)	90 (31.0)	1(0.8)	4 (3.3)	5 (4.2)

of pterygium in the study population may not be associated with the number of years worked as a kitchen staff. This may be because most of the older kitchen staff were assigned less laborious work. They were more in supervisory roles thus reducing their exposure to heat and smoke. Relationship between incidence of pterygia and employment length was observed in welders by Karai *et al.* (1984).

Pterygium distribution was higher (35.0%) amongst the cooks followed by the pantry workers (31.6%) although there were no statistically significant ($p < 0.05$) differences between them. This may be because most of the pantry workers help in the cooking especially making the fire.

CONCLUSION

Prevalence of pterygium among kitchen staff in

the senior high schools within the Kumasi metropolis is 31.0% with a significant difference in occurrence between the sexes and age. Years of work in the kitchen did not seem to be associated with the occurrence of the disease. The risk factors of pterygium were gender, age, heat, smoke and fumes from slicing onions.

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Table 3: Years of work as kitchen staff and development of pterygium

Years of work as kitchen staff	Total	Positive Cases	Percentage
< 1 year	25	9	36.0
1-5	93	29	31.2
6-10	65	20	30.8
11-15	23	9	39.1
16-20	20	7	35.0
>20	64	16	25.0
Total	290	90	31.0

Table 4: Distribution of pterygium among the various category of workers

Rank	Total	Cases (%)
Matron	27	5 (18.5%)
Cook	177	62 (35.0%)
Pantry worker	57	18 (31.6%)
Other	29	5 (17.2%)

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