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Ocular conditions among singed–hide butchers at The Kumasi abattoir

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ABSTRACT

This study attempted to determine the prevalent eye conditions among singed-hide butchers at the Kumasi abattoir (slaughterhouse) in Ghana. A cross-sectional study comprising 80 conveniently chosen singed-hide butchers at the abattoir was conducted. History taken from participants included participants' demographics and ocular and occupational history. Ocular examination included ophthalmoscopy and visual acuity. Diagnoses were made on the presence of a condition(s) in either or both eyes. The Statistical Package for Social Sciences (SPSS) version 17.0 was used to analyze data collected. Descriptive statistics and Fisher's exact test were employed. The overall prevalence of ocular morbidities was 63.8% among the respondents.

Ocular itchiness (77.5%) was the most widely reported symptom followed by teary eyes (70.0%). All respondents suffered from one or more oculo-visual symptoms. The commonest ocular diseases were pinguecula (38.8%), followed by pterygium (20.0%), conjunctivitis (2.5%) and cataract (2.5%). It was observed that singed-hide butchers at the Kumasi abattoir were at high risk of developing eye diseases attributable to the working environment.

Key Words: Butchers, Ocular morbidity, Conjunctivitis, Pterygium, Pinguecula, Cataracts

1. INTRODUCTION

Everyday work in hazardous conditions poses significant threat to human health.^[1,2] Exposure to toxins, radiation, vibration, particulate substances and poor indoor air quality in some work environments have all been associated to many different morbid states. Conditions like asthma, silicosis, allergy, deafness, fatigue, lung disease, ocular injuries and certain infectious diseases have been suffered by workers who work in poor and dangerous working environment.^[3–8]

Some occupations are inherently dangerous to health. A report revealed that more than a million workers in the UK suffer from a health condition caused or worsened by the work they do.^[9] It has been reported in some studies that

people involved in occupations like fire fighting, mining and construction suffer conditions such sleep disorders, cardiovascular disorders, musculoskeletal disorders, and even traumatic injuries leading to sudden deaths.^[10–13] Those who work in places where there is little or no regards for safety measures are said to be at even higher risk of these health hazards.

In Ghana, most people are involved in indigenous occupations like blacksmithing, traditional brewing, artisanal mining and oil palm extraction. Other people are involved in farming and traditional meat processing. One major aspect of the traditional meat processing is the singeing of the hides of slaughtered animals at the abattoir (synonymous to “slaugh-

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terhouse”) in preparing it for sale and consumption. All of these indigenous jobs require no formal skills; they employ crude methods and have little regards for occupational safety. Some studies have shown that persons found doing these jobs suffer from conditions such as heavy metal poisoning, burns, inflammatory eye diseases, skin diseases and other fatal conditions. For example, artisanal miners in Ghana use elemental mercury in the extraction of gold but they typically do not wear any safety clothing while handling the mercury.^[14-18]

Generally, abattoirs across the country are characterized by poor sanitary conditions. It is a common observation that the surroundings of these abattoirs are always concentrated with heat and smoke from the burning of scrap lorry tyres used as fuel during treatment of animal hides. There is poor control of flies and other birds who feed on the carrion of slaughtered animals. Microbial contamination of meat and meat products resulting from unhygienic conditions at some of these local slaughter houses has been reported in some studies. Herein, this study attempted to study eye conditions prevalent among butchers at the Kumasi abattoir in the Kumasi metropolis of Ghana.

2. METHODS

2.1 Sampling

We conducted a descriptive cross-sectional study at the Kumasi abattoir. Eighty (80) participants were purposively sampled for the study. The 80 participants included in the study were directly involved in the singeing of hide at the abattoir. As an on-site based study, all workers at the abattoir qualified to have their eyes examined but for the purposes of the study, the investigators focused on reporting on 80 participants who were directly involved in the hide – singeing.

2.2 Procedures/Data collection

One of the co-investigators administered questionnaires to the participants and translated the content of the questionnaires into Twi to aid the participants in answering them. The questionnaires sought for information about the participants’ demographic profiles, ocular and occupational history. We collected information about their age, length of working experience, suburbs where they live and the option to report if they had a known medical condition. A comprehensive eye examination was carried out on all participants. Distance visual acuity was assessed for each participant using a Snellen chart at six (6) meters backlit with luminance of 160cd/m². Ophthalmoscopy was carried out using a Welch Allyn direct Ophthalmoscope. A pentorch and ophthalmic loupes were employed in external eye examination. Diagnosis was made on the presence of a condition(s) in one or both eyes of a

participant.

2.3 Ethical considerations

The study and all the mentioned eye examination procedures were clearly explained to all participants. Informed consent was sought from all participants. Permission to carry out the study was sought from the authorities at the abattoir. The study was conducted with adherence to the Declaration of Helsinki.

2.4 Data analysis

Data collected from the study were analyzed using the Statistical Package for Social Scientists (SPSS) version 17.0 (SPSS, Inc., Chicago, IL, USA). Continuous variables are expressed as mean \pm standard deviation ($M \pm SD$). Descriptive statistics and Fisher’s exact were employed to find significant differences between comparable categorical groups; p values less than .05 ($p < .05$) was considered as significant.

3. RESULTS

3.1 Participants’ demographics

There was a 100% rate of participation. All the 80 respondents had their eyes examined. The respondents were all males with a mean age of 25.7 ± 6.3 . The modal age group was 20 – 29 years. Table 1 shows the age distribution of all respondents.

Table 1. Age distribution of respondents

Age Group (yrs)	Frequency (%)
12-19	17.5
20-29	57.5
30-39	17.5
40-49	6.3
50-59	1.2
Total	100

3.2 Eye disease and oculo-visual symptom states

Reports from the questionnaire administered to the respondents showed that all the participants had one form or the other of oculo-visual symptom. Some of them reported more than one of such symptoms. The most prevalent symptom was itchiness in the eyes (77.5%). Fifty-one of them were diagnosed with different eye diseases. This translated to an overall 63.8% prevalence of eye diseases. Eye diseases detected were largely limited to the anterior segment of the eye. Tables 2 and 3 summarize the eye diseases detected and distribution of the oculo-visual symptoms reported by the respondents.

Table 2. Eye diseases detected among respondents

Eye diseases	Prevalence (%)
Conjunctivitis	2.5
Pterygium	20
Pinguecula	38.8
Cataract	2.5
Total	63.8

Table 3. Distribution of oculo-visual symptoms

Reported symptoms	Frequency (%)
Headache	62.5
Blurred Vision	48.8
Double Vision	43.8
Tearing eyes	70.0
Burning sensation eyelids	40.0
Itchy eyes	77.5
Painful eyes	57.5

3.3 Length of working experience

We found out that the duration of work experience for the singed-hide butchers at the abattoir differed from participant to participant. The minimum reported was 2 years and the maximum was approximately 15 years. We categorized the length of working experience of the participants broadly into two groups of up to 5 years and more than 5 years in Table 4.

Table 4. Length of working experience

Number of years of experience (yrs)	Number of workers
Up to 5	32
More than 5	48
Total	80

3.4 Associations between the eye diseases detected and length of working experience

For the test of significance of the association between the eye disease detected and the length of working experience, Fisher’s exact test yielded a statistically insignificant association; for all cases $p \approx .2$. Table 5 shows a cross-tabulation of the length of working experience and the eye diseases detected.

Table 5. Cross-tabulation of length of working experience and eye diseases detected

Length of exposure to work environment (yrs)	Eye Conditions/Prevalence (%)			
	Pingueculum	Pterygium	Cataract	Conjunctivitis
Up to 5 years	16 (20%)	6 (7.5%)	0 (0)	0 (0)
More than 5 years	15 (18.5%)	10(12.5%)	2 (2.5)	2 (2.5)
Total	31 (38.75%)	16 (20%)	2 (2.5)	2 (2.5)

4. DISCUSSION

Many occupational based studies have reported eye diseases as part of the common conditions among some workers.^[19–21] All our study respondents were males; for no definitive reason the hide - singeing activity is limited to males only even though there are certain activities at the abattoir reserved for females. The age characteristics reported showed that majority of the respondents were in their twenties, with the modal age group (20-29 years) accounting for 57.5% of the study population. The plausible explanation for this finding is that, comparable to other indigenous industries the singeing process requires considerable stamina which is characteristic of most young persons.^[22]

The eye conditions detected among the butchers are similar to what have been reported among subjects who work in occupational set ups similar to that of these butchers.^[21, 23–25] The highly prevalent conditions, pingueculum (38.75%) and pterygium (20%) as well the least prevalent eye diseases found among the butchers have etiological bearing with the conditions present at the abattoir. The combustion of scrap lorry tyres for fire used for the singeing of the hide generates smoke, heat and particulate materials which could excite these eye conditions.

Other studies have linked the development of cataracts to exposure to thermal and other forms of radiation.^[26–28] Workers like these butchers who work close to fire and heat sources are at high risk of developing crystalline lens clouding and some corneal diseases which can significantly impair their vision. While our studies found conditions limited to the anterior segment of the eye, other studies have reported posterior eye diseases related to working in environment similar to the cited abattoir.

The various oculo - visual symptoms reported: teary eyes, itchy eyes and burning sensation may be due to frequent exposures to allergens in the abattoir.^[29] Noxious gases from the combustion of scrap lorry tyres could excite eye irritation. Floating dander could cause conjunctivitis.^[30, 31] Headache, double vision and blurred vision may be attributable to general fatigue and or pre-existing systemic condition among the butchers.^[32]

As reported in our results, we did not detect a statistically significant association between long term exposure to the work environment and the various eye diseases detected ($p \approx .2$). While this was what we found, longer exposures to harmful radiation and smoke have been mentioned as precursors to developing cataract, pterygium, pingueculum, retinitis and conjunctivitis.^[33–35] We may not have detected a statistically significant association between long term exposure to the work environment and the various eye diseases because of

the small sample size. It is however important to consider the findings in this study as having been influenced by possible confounders such as the age of the butchers and whether or not they suffered a particular systemic disease which could have played a role in the eye diseases detected. Some ocular surface conditions like dry eyes, itchy eyes, burning sensations in the eye and development of pinguecula and or pterygium have a positive association to systemic diseases like hypovitaminosis A, Sjogrens disease and arthritis. Diabetes and other metabolic diseases have also been implicated in the development of cataract.^[36-39]

We thus seek to state that, our oculo-visual findings may have possibly been influenced by some conditions present among the butchers and that they are not solely due to the environment in which they work. It was also confirmed that, none of the respondents in this study used any form of personal protective equipment during the singeing of the hide. Studies show that persons working in such environment are at high risk of developing eye diseases.^[40,41]

5. CONCLUSION

The study found a high prevalence (63.75%) of eye conditions among the singed-hide butchers. The most prevalent condition was pinguecula (38.75%) followed by pterygium (20.0%). Cataracts and conjunctivitis were the least prevalent conditions (2.0%). Each of the respondents suffered from one or more oculo-visual symptom. Workers at the abattoir are encouraged to use personal protective equipment to minimize exposure to the hazardous agents at their work place. Regular eye examination and health education are recommended for the butchers at the abattoir. Future studies should investigate how other pre-existing systemic co-morbidities could influence our oculo-visual findings.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that they have no financial relation regarding the conduct of this study. The authors also declare that they have no conflict of interests regarding the publication of this manuscript.

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