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Original Research Article

Pattern of ocular disorders in an oil community

Efeoghene U. Ani[1], Bassey Fiebai[2]*

[1]Anterior Segment Clinic, The Ophthalmic Specialists Eye Hospital, Port Harcourt, Rivers State, Nigeria
[2]Department of Ophthalmology, University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria

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***Correspondence:**
Dr. Bassey Fiebai,
E-mail: bassief@yahoo.com

ABSTRACT

Background: Environmental pollutants particularly from industries can be a significant cause of ocular disorders. This could affect not just quality of life but also productivity especially in an occupationally active age group. The aim of this study was to determine the pattern and prevalence of ocular disorders in an oil community.
Methods: A retrospective study was carried out after a one day free medical outreach at Ekerekana- ama, Okrika. Information culled from the records of each patient included demographic data, visual acuity, ocular findings and diagnosis.
Results: A total of two hundred and forty-two subjects were studied. Refractive error and presbyopia were the commonest ocular disorder seen. Ocular surface disorders comprising of allergic conjunctivitis, pterygium, photophobia and bacterial conjunctivitis, was the second most common with a prevalence of 12%.
Conclusions: The pattern and distribution of ocular disorders in this study mirrors that reported in other studies done in oil communities to a considerable extent. Government interventions in formulating and regulating refining processes should be reinforced. Provision of more accessible eye care in those communities will also improve their ocular status significantly.

Keywords: Ocular disorders, Ocular surface disorders, Oil community, Pattern

INTRODUCTION

The ocular surface is a delicate structure and it is vulnerable to potential environmental insults by the nature of its function and anatomic location.[1,2] The integrated functions of various components of the ocular surface must perform optimally and disruption of the system may or may not produce symptoms.

When individuals are exposed to certain harmful conditions that can result in ocular disorders, it reduces man power therefore lowering the total output and production in that community. Most ocular disorders which are environmentally related, could be prevented if the necessary precautionary measures are put in place always. It can also be reduced when the individuals are properly educated on the importance of seeking health care early and proper use of safety measures to prevent ocular disorder and the early presentation.[3,4]

Other exposures that can lead to ocular disorders are ultraviolet rays, extremely bright lights as well as chemicals used in the refining processes in petroleum industries.[5,6] These could cause adverse ocular side effects which may manifest as photokeratitis, characterized by pain and grittiness. This could result in reduced corneal sensitivity and subsequently damage to the cornea. Long term exposure maybe partly responsible for ocular surface disorders such as pterygia, pinguenculae, band keratopathy and climatic drop keratopathy. Ocular surface diseases can affect not just

sight but also quality of life and even blindness if not managed properly.

Other ocular disorders that could result from such exposure include blepharitis, presbyopia, cataract and glaucoma etc.[7]

The aim of this study is to identify the pattern of ocular disorders in an oil community located in Ekerekana-Ama Okrika, Rivers state, the results of this study will contribute to the greater knowledge and understanding of the effect of environmental pollutants on ocular health.

METHODS

This is a population-based retrospective cross- sectional study using convenience sampling of the people living around an oil community located in Ekerekana-Ama, Okrika, Rivers state, Nigeria. Each consecutive patient who presented themselves for the free medical outreach was examined. The free medical outreach was carried out between April-May 2017. Eye health talk was given at the beginning of the screening sessions. Provisions were made for personal data, vital signs, work history, ocular history and examination findings.

Thereafter, each registered participant had unaided visual acuity of each eye determined, using Snellen's chart (or E-chart) which was placed at 6-meters (or 3-meters for those with poor vision) from the subject. Examination for visual acuity was done in the open under bright daylight. Refraction and examination of the eyes were done in a class room. Subsequently, each subject had refraction of the eyes performed by the optometrists, while the ophthalmologist performed detailed examination of the eyes of the subjects. Visual acuity was classified in accordance with the WHO criteria. By this criterion, visual acuity 6/18 or better was considered normal vision, visual acuity <6/18 to3/60 was considered low vision while, visual acuity greater than 3/60 were categorized as blindness. All the data obtained were entered in to a pre-designed data- sheet for subsequent analysis.

The data was analysed with Statistical package for Social Sciences (SPSS) version 22. Student's t-test was used to determine statistical significance between two quantitative variables while Pearson's Chi-Square was used to determine the significance between qualitative and quantitative variables. The level of significance was set at p-values of <0.05.

Ethical approval was given by the relevant institutional board for this outreach.

RESULTS

A total of two hundred and forty-two subjects were analysed in this study. This was made up of 87 male subjects (36%) and 155 female subjects (64%). The overall mean age was 38.51±19.26 years with a minimum age of 6 year and maximum of 86 years (Table 1).

Table 1: Age and sex distribution of the population.

Age group (years)	Sex		Frequency (%)
	Male n (%)	Female n (%)	
<10	7.0 (2.9)	9 (3.7)	16 (6.6)
11-20	22 (9.1)	17 (7.0)	39 (16.1)
21-30	8.0 (3.3)	18 (7.0)	26(10.7)
31-40	8.0(3.3)	36(14.9)	44 (18.2)
41-50	19 (7.8)	31 (12.8)	50(20.7)
51-60	12(5.0)	23 (9.5)	35 (14.5)
61-70	8.0 (3.3)	15 (6.2)	23 (9.5)
>70	3.0 (1.2)	6 (2.5)	9 (3.7)
Mean			38.51±19.26
Total	87 (36)	155 (64)	242 (100)

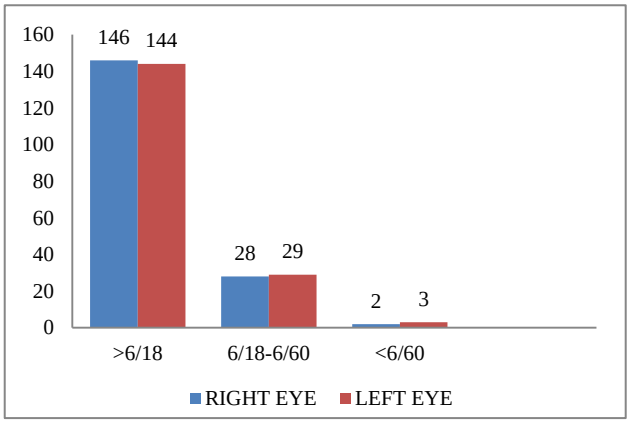

Figure 1: Frequencies of the visual acuities of the right and left eyes.

The frequencies of the right and left visual acuities of the patients are shown in figure 1. An average of 145 patients had visual acuity greater than 6/18 in both eyes as shown in the table with frequencies of the right and left visual acuities (Figure 1).

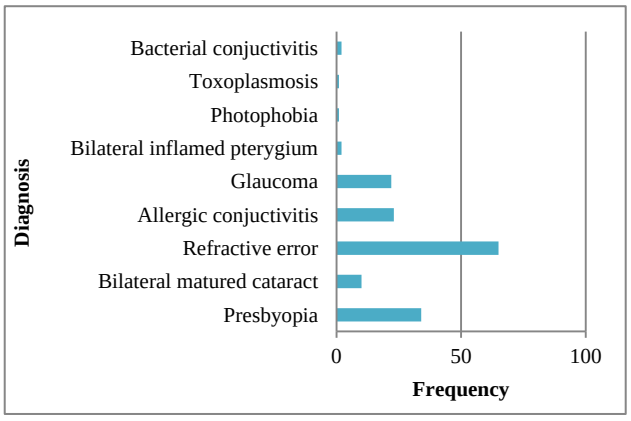

Figure 2: Distribution of the various ocular disorders.

The various frequencies of the ocular disorders among the population used for this study is shown with the highest being refractive error (Figure 2).

Table 2: Distribution of ocular disorder by sex.

Diagnosis	Sex		Total (%)
	Male n (%)	Female n (%)	
Presbyopia	15 (9.3)	19 (11.8)	34 (21.2)
Bilateral cataract	1 (0.6)	9 (5.6)	10 (6.2)
Refractive error	19(11.8)	46(28.6)	65 (40.4)
Allergic conjunctivitis	9 (5.6)	16 (9.9)	25 (15.5)
Glaucoma	6 (3.7)	16 (9.9)	22 (13.7)
Bilateral pterygium	1 (0.6)	1 (0.6)	2.0 (1.2)
Photophobia	1(0.6)	0 (0.0)	1.0 (0.6)
Toxoplasmosis	1 (0.6)	0 (0.0)	1.0 (0.6)
Bacteria conjunctivitis	0 (0.0)	1 (0.6)	1 (0.6)
Fishers exact	9.892	P=0.261	

A bivariate analysis of ocular disorders with sex distribution is shown. The differences in proportions in ocular disorders by sex were not statistically significant. (P>0.05) (Fisher's exact=9.892, p=0.261).

DISCUSSION

The study area Ekerekana Ama hosts the Port Harcourt refinery company which is one of the major petroleum refineries in the country. Workers as well as the members of that community are therefore constantly exposed to the pollutants and chemical irritants that are produced because of the refining processes. These include carbon black, hydrogen sulphide and other hydrogen gases, ammonium compounds, catalyst dust etc.[7]

The mean age of the population in this review is 38.51± 19.26, with the peak age groups of 31-40, 41-50 and 51-60, accounting for almost half of the study population (49.6%). This may be reflective of the visual needs seen in this age groups which compelled them to present at the outreach. Our mean age is like that reported by Wokoma.[8] In our series, more females (64%) presented at the outreach than males (36%). This may be due to the fact that the outreach was carried out on a week day rather than a weekend, so the males were likely at work in the offices or farms. This finding is similar to that reported by Abraham and Monsudi in 2 different geopolitical zones of the country, were an interplay of culture, finance and social factors was cited as possible reasons for this.[9,10]

Most of the participants 145 (59.9%) had good visual acuity in both eyes. Refractive error was the commonest eye disorder in this study. While the prevalence of the combination of refractive error and presbyopia was 40.9%. A similar pattern was reported by Anyiam et al and Abraham et al in their series.[9,11] Ocular surface disorders (Allergic conjunctivitis, bacterial conjunctivitis, pterygium and photophobia), was the second most common ocular disorder found in this series with allergic conjunctivitis constituting majority of this. The prevalence of ocular surface disorders in this oil community was 12%. Tebepah in a study conducted in the same state found allergic conjunctivitis to be the commonest eye disorder.[12] In Wokoma's series, a high incidence of allergic conjunctivitis was reported and this corresponded to the occupationally active group in their study. Ocular surface disorders are not uncommon presentations in areas with un-tarred and dusty rural roads that can promote air-borne allergens which can cause acute and chronic ocular irritation and exacerbate allergic conjunctivitis. It can also be seen in industrial settings with exposure to toxic refinery chemicals.[7,8,11,13]

Glaucoma ranked the fourth (14%) most common eye disorder from this study in contrast with other community based studies where glaucoma ranked as 1st or 2nd most common ocular disorder and major cause of vision loss. [8-11,14] This may be due to the fact that patients with ocular disorders related to the environmental pollutants are likely to present in greater numbers in outreaches like this than those without apparently obvious symptoms like glaucoma.

Incidentally the prevalence of cataract in this study was very low as would be expected of community studies of this nature. Most studies report a similar pattern to the global pattern where cataract accounts for the major cause of ocular disorders, visual impairment and blindness.[8,10] The age group presenting for this outreach will be a major contributory factor to this deviation in pattern.

CONCLUSION

The pattern and distribution of ocular disorders in this study mirrors that reported in other studies carried out in oil communities to a considerable extent. It also gives insight to the prevalent ocular problems in an oil community and provides a basis for larger studies to be carried out. Government interventions in formulating policies and regulating refining processes should be reinforced. More accessible eye health care systems should be put in place at the community level by the relevant authorities.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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