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PREVALENCE OF DRY EYE SYMPTOMS AMONG PATIENT COMPANIONS

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ABSTRACT

Background: Dry eye disease or dry eye syndrome is a disorder of tears and ocular surface which has been reported to be common and can lead to visual disability. Identified common risk factors include age, gender and certain medications. Not much has been documented on this apparently common problem in the country, thus necessitating the study. **Aim**: The aim of this study was to find out the prevalence of dry eye symptoms in persons who accompany patients to the eye clinic. **Materials and Methods**: Data was collected through administration of questionnaire that incorporated the Ocular Surface Disease Index (OSDI) to the sample population after obtaining an informed consent. Information obtained was analysed using Statistical Package for Social Sciences(SPSS) version 21. **Result**: There were 466 candidates recruited for the study, comprising 266(57.1%) males and 200(42.9%) females. The prevalence of dry eye was 16.3% in the study. About one third of the candidates were within the 40 to 49 years age group. Frequency of dry eye symptoms was commonest in the 50 to 69 years age range. Presence of systemic diseases and eye problems, use of systemic medication and frequent reading from computers, hand set or books were statistically significant on crude analysis but taking age into consideration, only the presence of eye and systemic diseases were significant. (p=0.017, OR=0.413; CI of 0.200-0.853) and (p=0.000, OR= 0.072; CI of 0.037-0.141) respectively. **Conclusion**: Prevalence of dry eye symptom in the population studied was 16.3%. There is strong association between dry eye symptoms and, the presence of systemic and eye diseases. Further studies are required to assess the relationship between various eye problems and systemic diseases and dry eyes.

KEYWORDS: Patient companions, dry eyes symptoms, prevalence.

INTRODUCTION

Dry eye disease (DED) or dry eye syndrome (DES) is a disorder of tear film resulting from tear deficiency or anomaly like excessive evaporation. It is associated with symptoms of ocular discomfort.[1-3] and disability.[3] It has been defined by the Definition and Classification Subcommittee of the International Dry Eye Workshop as, "a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface".[3] It is characterised by burning sensation, irritation, redness, blurring of vision, frequent blinking and pain. There may be reflex tearing.

The disease is said to be common globally.[4] About 1 to 4.3 million American population between 65 and 84 years have symptoms suggestive of dry eyes.[3] It has been reported in postmenopausal women to range from 7% in the United States, to 33% in Taiwan and Japan.[5] Also, it has been observed that 25% of persons visiting the eye clinic have dry eye symptoms.[6] Twenty one per cent of adult Chinese population were found to have dry eyes[7] and 22.9% of 148 of a population based study in Philippines.[4]

Risk factors include, advanced age,[8,9] gender and certain medications.[9,10] While some authors identified females as being at greater risk,[9,11] others identified males to be more prone,[9] but females generally are said to be at a greater risk because of reduced estrogen secretion with advancing age. Drugs and other factors that have been implicated include: antihistamine, beta blockers, tricyclic antidepressants and diuretics; irradiation, age, female gender, smoking and menopause.[11] Dry eye disease was found to be more common in urban compared to rural areas.[7,11] Itching was the commonest presenting symptom.[4] Age was a common risk factor in most of the studies, though Sharma[11] found greater prevalence in persons 30-40 years and premenopausal women. The disease may be diagnosed in the absence of the symptoms, but on observation by the ophthalmologist.

Several studies have been conducted in different parts of the world but in this black population there is paucity of studies; little has been documented. Many patients may present with symptoms suggestive of the condition. The aim of this study was to estimate the prevalence of dry eye symptoms among the companions of patients presenting at the ophthalmology department of a tertiary institution in Nigeria, sub-Saharan Africa.

MATERIALS AND METHODS

A cross sectional study was conducted among persons 20 years and above, who accompanied patients to the eye clinic of a tertiary institution within a period of 2 months. After an informed consent was obtained, the questionnaire was administered. The questionnaire incorporated the Ocular Surface Disease Index Questionnaire (OSDI)[12], information on biodata and if the candidate had eye problems, was on systemic medications or eye drops, if he/she read books or read from computer and handsets. All the candidates fell into one of the following categories of dry eye as described by the OSDI questionnaire: normal, mild, moderate and severe. The OSDI questionnaire had a total of 12 questions related to dry eyes. It was subdivided into three parts: the first bordered on dry eye symptoms, the second on effects of dry eyes and the third part on aggravating symptoms. Those who either gave incomplete information or did not want to participate were excluded.

The data collected were entered into the computer and analysed using Statistical Package for Social Sciences (SPSS) version 21. Responses were presented using frequency distribution table and bar chart. Tests of significance of association between categorical variables were done using chi-square. Binary logistic regression analysis was used to identify independent predictors of dry eye among study participants. Adjusted odd ratio (AOR) with the associated 95% CI were reported appropriately and statistical significance was drawn at p-value of less than 0.05 ($P<0.05$).

RESULTS

The total number of study participants was 466 of which 266(57.1%) were males and females 200 (42.9 %). About one-third of the study participants (31.1%) were within 40-49 years age group, table 1. Most people (96.1%) read from computer or handset and books (96.6%). Whereas the prevalence of self-reported systemic diseases was (32.4%), about half (48.7%) confirmed taking medication in the last six months. In all, the prevalence of dry eye was (16.3%).

Table. 1: Age distribution.

Age range in years	Dry eye symptoms Yes. n=76	Dry eye symptoms No. n=390	Total within age range 466	
20-29	10(13.5%)	64(86.5%)	74(100%)	$X^2 = 14.222$
30-39	15(11.4%)	117(88.6%)	132(100%)	
40-49	20(13.8%)	125(86.2%)	145(100%)	P = 0.007
50-59	21(24.7%)	64(75.3%)	85(100%)	
60-69	10(33.3%)	20(66.7%)	30(100%)	

The frequency of the symptoms of dry eyes was highest in 50 to 69 years of age. There was increasing tendency of dry eye with age. This was statistically significant (Chi square=14.222, df =4, P-value=0.007).

The association between the characteristics of study participants and dry eye status is depicted in table 2.

Table. 2: Association between characteristics of study participants and dry eye status.

	Dry eye symptoms Yes (n=76)	Dry eye symptoms No (n=390)	Total (n=466)	X^2	df	P-Value
Sex				0.025	1	0.876
Male	44 (9.4%)	222 (47.6%)	266 (57.1%)			
Female	32 (6.9%)	168 (36.1%)	200 (42.9%)			
Has Systemic disease				24.231	1	0.000
Yes	43(9.2%)	108(23.2%)	151(32.4%)			
No	33(7.1%)	282(60.5%)	315(67.6%)			
Took medications within 6 months				16.067	1	0.000
Yes	53(11.4%)	174(37.3%)	227(48.7%)			
No	23(4.9%)	216(46.4%)	239(51.3%)			
Had eye problems				94.090	1	0.000
Yes	59(12.7%)	84(18.0%)	143(30.7%)			
No	17(3.6%)	306(65.7%)	323(69.3%)			
Read books				5.451	1	0.020
Yes	70(15.0%)	380(81.0%)	450(96.6%)			
No	6(1.3%)	10(2.1%)	16(3.4%)			
Read from handset/computer				6.994	1	0.008

Yes	69(14.8%)	379(81.3%)	448(96.1%)			
No	7(1.5%)	11(2.4%)	18(3.9%)			

Prevalence of dry eye symptoms was highest among those who read often either from books 15.0% of the 466 candidates (Chi square =5.451, df=1, p-value=0.020) or from handset and computer in 14.8% (Chi square=6.994, df=1, p-value=0.008).

There were 227(48.7%) of the 466 candidates who had either taken or were on systemic medications within 6 months prior to the study. Those who had dry eye symptoms among them were 53 and constituted 11.4% of the total that had dry eye symptoms, P= 0.000. The various types of medications which the candidates had taken are shown in Table 3. Some did not know the names of the medications.

While 151 candidates had systemic diseases, 315(67.6%) did not. Those who had systemic diseases with dry eye symptoms were 9.2% of the 76 (16.3%) candidates with the symptoms. P =0.000. The common systemic diseases listed were: hypertension, diabetes mellitus, allergy and osteoarthritis. Other less common diseases were malaria and peptic ulcer disease.

While 143(30.7%) gave history of eye problems, 323(69.3%) did not. Fifty nine (12.7%) of the patients with dry eyes gave history of eye problems. P=0.000. The common eye problems reported were refractive error, itching, discharge, blurred vision. Others were redness and one person had had cataract surgery.

Table. 3: Systemic medications consumed 6 months prior to the study.

Drug	Commonest in the group
Antihypertensives	Aldomet, vasoprin, moduretic
Pain relievers	Ibuprofen, paracetamol
Antibiotics	Ampicillin/cloxacillin, amoxicillin
Antimalarial	Lonart, P-Alaxin, chloroquine, artesunate, coartem(artemether /lumefantrine combination)
Hypoglycaemic agents	Daonil, metformin, Insulin
Herbs	
Others	Cough syrup, athrotec, amlodipine, piriton and those with unknown names

In some instances, people took multiple medications but the commonest consumed were antihypertensive, pain relievers and antimalaria tablets.

The occupation of the respondents are shown in Figure 1. Majority were civil servants. Others were students, traders, retirees, farmers, dependents, brick layers and shoemakers/repairers.

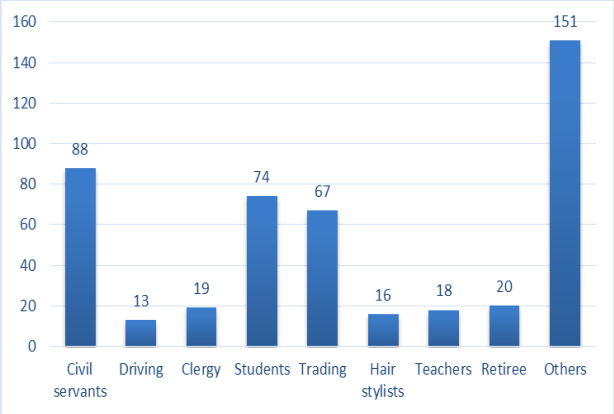

Figure 1. Occupational distribution of participants

Multivariate logistic regression analysis for the predictors of dry eye symptoms is shown in Table 4. With age in consideration, effect of reading became insignificant; from computer and cell phone (p=0.684, OR 0.748; 95% CI 0.19 to 3.03), and books (p=0.598, OR 1.474; 95% CI 0.35 to 6.23). Here the last age group was used as reference. The effect of systemic medications also became insignificant (p=0.448, OR 0.749; CI 0.356-1.579).

Table. 4: Association between characteristics of study participants and dry eye status.

Variable	P value	Odd's Ratio(OR)	95% CI
Age (years)			
20-29	0.654	0.743	0.203-2.723
30-39	0.057	3.114	0.965-10.047
40-49	0.054	3.061	0.983-9.535
50-59	0.200	2.097	0.675-6.517
60-69	-	1.00	-
Sex Male Female	 0.846 -	 1.062 1.00	 0.581-1.941 -
Read from computer/cell phone Yes No	 0.684 -	 0.748 1.00	 0.185-3.026 -
Read books Yes No	 0.598 -	 1.474 1.00	 0.349-6.231 -
Took medications last 6 months Yes No	 0.448 -	 0.749 1.00	 0.356-1.579 -
Has systemic disease Yes No	 0.017 -	 0.413 1.00	 0.200-.853 -
Has eye problem Yes No	 0.000 -	 0.072 1.00	 0.037-.141 -

DISCUSSION

This study was carried out to find out the prevalence of dry eye symptoms among companions of patients visiting the eye clinic of a tertiary health institution in a sub-Saharan African country. It found that 16.3% had dry eye symptoms. This finding falls within documented prevalence range of 7.8% to 93.2%.[13] In a population based study of elderly Americans, 14.6% were found positive with one or more dry eye symptoms.[14] Twenty one percent (21%)of adult Chinese population were found to have dry eyes[7]and also 22.9% of 148 of a population based study in Philippines.[4] Another clinic based study confirmed frequency of 17%.[3] Lee et al[15] quoted 27.5% prevalence in an Indonesia based study.

The common consistent risk factors that have been listed for dry eye include: Older age group, female sex, postmenopausal estrogen therapy, medications like Omega-3 and Omega -6 fatty acids, antihistamine, tricyclic antidepressants, diuretics, beta blockers, systemic diseases like connective tissue disorders, diabetes mellitus, HIV infection, hepatitis C infection, procedures like LASIK and refractive excimer laser surgery , large incision extracapsular cataract extraction, etc.[16]

More males presented with the symptoms compared with females which is similar to the finding in some other studies.[7,9] In some others, it was found more prevalent in females.[4,17]

The reason for more males being affected in this study cannot be ascertained. It may be related to occupation.

The 50 to 69-year age group was mostly affected. Effect of age on dry eye was significant with crude analysis but considering the other predictors, age difference became insignificant. This compares with other studies where the prevalence was highest in older persons.[15] For some, the disease was highest in people with mean age of 54.6 years[4], 58.4 years[7] and 37years.[15] Older persons being affected more could be explained by decrease in tear secretion that is seen with ageing.

Presence of systemic diseases, consumption of systemic medications, having eye problems, reading from cell phone, computer or books on crude analysis were all statistically significant but with multivariate logistic regression analysis for independent predictors, only presence of systemic problems and eye problems were significant.

The common systemic diseases recorded were hypertension, diabetes mellitus, allergy and osteoarthritis. Higher prevalence rates of dry eye with LASIK and refractive surgery, Vitamin A deficiency, hepatitis C infection and hematopoietic stem cell transplantation has been reported.[16] Hypertension and diabetes did not have high prevalence records in the study conducted by Kelvin Matthew et al.[4] Menopausal women and smokers had the highest prevalence in their study. Some authors have established strong association between Sjogren's syndrome, a cause of arthritis and dry eye disease.[18]

In a study carried out among an adult Chinese[7], diabetes mellitus was identified as a significant risk factor. Sharma[11] also identified diabetes mellitus as well as hypertension, osteoarthritis and others as risk factors. The present study however did not relate the common systemic problems individually with dry eyes.

Antihypertensives (mostly Aldomet, vasoprin, moduretic), pain relievers (especially Ibuprofen and paracetamol) and antimalarial drugs (mainly Lonart, P-Alaxin, chloroquine, artesunate and artemether Lumefantrine combination) recurred most often among the drugs the candidates took. Beta blockers were the most common systemic medications identified by Panggatet al.[4] The common eye problems reported by participants were refractive error, itching, discharge and blurred vision. In their study on prevalence of dry eye in Chinese population, refractive error was not a significant risk factor though corneal astigmatism was.[7] Associated eye disease was reported in only 9% of 148 candidates that were examined in another study.[4]

What the present study has shown is strong association between dry eye symptoms and, eye and systemic diseases. What this means is that history and examination for systemic and eye diseases should be routine in patients with symptoms suggestive of dry eyes.

CONCLUSION

This study conducted in a black population in Sub-Saharan, West Africa has revealed a prevalence of dry eye symptoms of 16.3%. Males were more affected than females, though not significant. The age group that was mostly affected was 60 to 69 years of age (33.3%). Presence of systemic disease and eye problem were significantly associated with dry eye symptoms. It is of note that the study was conducted on subjective dry eye symptoms as given by the candidates. All the candidates with subjective symptoms may not necessarily have dry eye signs. It is therefore desirable to conduct further studies that will include clinical tests for dry eyes in candidates with dry eye symptoms.

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