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Original article

Survey of eye practitioners' preference of diagnostic tests and treatment modalities for dry eye in Ghana

Kofi Asiedu, OD, Dr.[a,b,*], Samuel Kyei, OD PhD[b], Benedict Ayobi, OD[b], Frank Okyere Agyemang, OD[b], Reynolds Kwame Ablordeppey, OD[c]

[a] Eye Center, Komfo Anokye Teaching Hospital, Kumasi, Ghana
[b] Department of Optometry, School of Allied Health Sciences, College of Health and Allied Science University of Cape-Coast, Cape-Coast, Ghana
[c] Department of Optometry and Visual Science, School of Bioscience, College of Science, KNUST, Kumasi, Ghana

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ABSTRACT

Purpose: This study sought to provide an evidence-based profile of the diagnosis, treatment and knowledge or opinions on dry eye among optometrists and ophthalmologists in Ghana.
Methods: This was a cross-sectional survey
Results: The responses of 162 participants are included in the analysis. The most commonly used test to diagnosed dry eye disease was tear break-up time followed by patient history. The most common symptom doctors heard from dry eye patients were burning sensation followed by foreign body sensation. The most often prescribed first- line treatment for dry eye was aqueous–based artificial tears followed by lipid-based artificial tears. Most practitioners considered meibomian gland dysfunction as the most common cause of dry eye followed by pterygium. The most often used test to guide or gauge therapeutic effect is patient history followed closely by tear break-up time. Most practitioners reported that 10%–20% of all their patients they see in a day are diagnosed of dry eye.
Conclusion: This study showed tear break up time was the main test majority of practitioners in Ghana used to diagnose dry eye but patient history was the main test used to gauge therapeutic effect over time. Burning sensation was the commonest symptom practitioners heard from dry eye patients whilst artificial tears was their main and first-line treatment for dry eye.
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1. Introduction

Dry eye is a prevalent ophthalmic disease worldwide, with estimated prevalence of 4.3% to 75% [1–15]. Apart from it being a prevalent ophthalmic disease; it also has a huge impact on the quality of life of patients with dry eye. In terms of the impact on quality of life, severe dry eye compares with moderate angina making it an important disease of public health concern [3,4]. Dry eye can affect surgical outcomes, compromise the ocular surface defense system, also lead to contact lens wear discomfort and contact lens wear drop out [2]. In Ghana, there are no population based prevalence studies on dry eye but a recent cross sectional study among undergraduate university students in Ghana revealed a prevalence of 44.3% [1]. One could undoubtedly argue that dry eye is very prevalent in Ghana. This implies that eye care practitioners in Ghana probably encounter a lot of patients with dry eye.

However, there is no specific or gold standard diagnostic test and treatment modality for dry eye disease [2]. More worrying are the reported poor repeatability of several clinical tests except symptom assessment and a lack of a strong correlation between symptoms and several clinical test results [16]. Dry eye by definition is considered a symptomatic disease with associated clinical signs [2]. Diagnosis and treatment for dry eye tend to differ from practitioner to practitioner. Since there are no widely accepted protocols for dry eye, practitioners often underestimate this ophthalmic disease.

A few studies have been conducted in Europe and United States to determine the most often used diagnostic test for dry eye and treatment philosophy among eye care practitioners [17–22]. These studies are important because in the search for a gold standard diagnostic test and treatment modality for dry eye, it's imperative for researchers to know the most common diagnostic test or tests and treatment modality employed by eye care practitioners in various regions of the world.

No studies have been conducted among eye care practitioners in Ghana and Africa for the most part on the diagnosis and

* Corresponding author.
E-mail address: kasiedu60@yahoo.com (K. Asiedu).

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treatment modalities for dry eye. All studies conducted in United States reported symptoms assessment as the most often used algorithm for dry eye diagnosis. Other studies in United Kingdom and Australia confirm symptoms assessment followed by tear break-up time or fluorescein staining as the most used diagnostic tools for dry eye diagnosis [17–21].

However, a study among practitioners in Spain reported Tear break-up time followed by Schirmer test and non-invasive tear break-up time as the most used diagnostic test [22]. In fact, in that study only a few practitioners reported a preference for using symptoms assessment for the diagnosis of dry eye.

This means that, it will be wrong to assume that practitioners around the world are using similar or the same metric in diagnosing dry eye. Hence, there is the need for studies in various regions to ascertain how the disease is diagnosed and the treatment modalities employed by eye care practitioners. Also studies have indicated some differences in the preference of diagnostic tests among optometrists and ophthalmologists [20]. This study sought to provide an evidence-based profile of the diagnosis, treatment and knowledge or opinions on dry eye among optometrists and ophthalmologists in Ghana.

2. Methods

This was a cross-sectional survey among eye doctors (optometrists and ophthalmologists) in Ghana. The only inclusion criteria was, being an eye care practitioner registered to legally practice optometry or medicine (ophthalmology) in Ghana and affiliated with the Ghana Optometric Association and the Ghana Ophthalmological society. All optometrists in the study had the Doctor of Optometry (OD) degree and ophthalmologists had the Bachelor of medicine and Bachelor of surgery (MB BCh) along with a hospital-based residency training in ophthalmology.

Doctors were invited to participate in a dry eye survey. All doctors who consented to participate in the study were send either a hard copy, an email version or a watapp version of the study questionnaire. Informed consent was sought from all participants after a thorough explanation of the study's purpose and objectives. All participants were assured that their responses will be held in confidence and their individual identities would not be disclosed. Ethical approval for the study was sought from the University of Cape Coast ethics review committee (FYP/16/12). All procedures and protocol for the study were conducted according to the tenets of the declaration of Helsinki. At the end of the study a total of 162 eye care practitioners correctly filled the questionnaire of which 20 were ophthalmologists and 142 were optometrists. The total eligible optometrists were 400 and ophthalmologist were 100 yielding a response rate of 33.5% and 20% respectively.

2.1. Questionnaire

A modified version of the Williamson et al. [23] questionnaire was used in this study. This questionnaire has been used previously in a similar study. The questionnaire was piloted among six optometrists and their responses were used to fine tune the questionnaire before the main study. The questionnaire had clear instructions on how to proceed. Doctors were allowed to choose a single answer for each question. The questionnaire included questions on the most used test to diagnose dry eye, most often reported symptom by dry eye patients, first-line treatment for dry eye, most used test to gauge or guide therapeutic effect, commonest cause of dry eye (in their opinion), time taking to examine and talk to dry eye patients, in their estimation how many patients in a day they diagnosed as having dry eye, their main source of information on dry eye etc. For details about the questionnaire. See Supplementary material.

2.2. Data analysis

All statistical analyses were performed using SPSS V.21.0 (SPSS, Chicago, IL USA) statistical package. Frequencies and percentages were used to ascertain most used clinical test, most used treatment, common cause of dry eye and other variables (Table 1).

3. Results

At the end of the study a total of 162 eye care practitioners completed the questionnaire of which 20 were ophthalmologists and 142 were optometrists. The total eligible optometrists were 400 and ophthalmologist were 100 yielding a response rate of 33.5% and 20% respectively. The male to female ratio was 124 (76.5%):38(23.5) respectively. The responses of these 162 participants are included in the analysis. The most commonly used test to diagnosed dry eye disease was tear break-up time followed by patient history. This is shown in Table 2. The most common symptom doctors heard from dry eye patients were burning sensation followed by foreign body sensation. The most often prescribed first- line treatment for dry eye was aqueous–based artificial tears followed by lipid-based artificial tears. Most practitioners considered meibomian gland dysfunction as the most common cause of dry eye followed by pterygium. This is shown in Table 2.The most often used test to guide or gauge therapeutic effect is patient history followed closely by Tear break up time. Most practitioners reported that 10%-20% of all their patients they see in a day are diagnosed of dry eye .Practitioners reported textbook 93(57.9%), journal articles 45(27.9%), continuous professional education lectures 10(6.2%), professional magazine 6 (3.7%), senior colleagues 6(3.7%) and experience 1(0.6%) as their main source of information on dry eye. Practitioners reported seeing or diagnosing allergic conjunctivitis in dry eye patients most often "YES" 73(45.3%) "Sometimes" (42.9%) and "NO" 19(11.799%). Some 62.1% of practitioners reported having no preference for a particular artificial tear whilst 37.9% reported a preference for a particular artificial tear. Details are presented in Table 2.

4. Discussion

The study provides an overview of the diagnosis and treatment modalities adopted by eye care practitioners in Ghana. To the best of our knowledge no study of this kind has been conducted in Ghana and Africa till date. The most often use diagnostic test in this study is tear break-up time which is in sharp contrast with the most often used test in United States, Australia and United Kingdom which appears to be symptoms assessment [17–21,24]. However, our findings are consistent with Cardona et al. [22] who reported tear break–up time as the most used or preferred test for the diagnosis of dry eye among eye care practitioners in Spain.

Table 1
Demographic characteristics of participants.

Gender	Number of optometrist	Number of ophthalmologist
male	111(78.2%)	13(65%)
female	31(21.8%)	7(35%)
Years of practice		
5 years or less	99(69.7%)	11(55%)
6–10 years	39(27.5%)	2(10%)
11–20 years	4(2.8%)	4(20%)
21–30 years	0(0%)	3(15%)
31–40 years	0(0%)	0(0%)
Dry eye specialist		
Yes	23(16.2%)	1(5%)
NO	119(83.8%)	19(95%)

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