GLAUCOMA

Pattern of presentation and risk factors of dry eye disease among glaucoma patients on topical medications in Ahmadu Bello University Teaching Hospital, Zaria

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Introduction: Glaucoma is the second leading cause of blindness in the world. Globally, 36 million are blind[1], and of these, 4.5 million (12%) are blind from glaucoma.[2] There is strong evidence suggesting that glaucoma medications may contribute to ocular surface disease (OSD) and the development of dry eye disease (DED).[3,4]

Methods: This was a hospital-based descriptive, cross-sectional study of 181 adult glaucoma patients seen at the Eye Clinic of Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State, Nigeria. Ethical approval for the study was obtained from the Ethics and Research Committee of the Hospital and informed consent was obtained from the participants.

For the purpose of this study, the diagnosis of dry eye disease was based on the Dry Eye WorkShop Diagnostic Methodology[5] as follows: presence of a positive Ocular Surface Disease Index(score of $\geq$ 13)[6] together with either an abnormal Schirmer's 1 test (reading of less than 10mm wetting in 5 minutes)[7] or an abnormal Tear Break Up Time (an appearance of the first randomly distributed dry spot in less than 10 seconds).[7]

Chi-square test and binary logistic regression were used to check for the association of risk factors with DED and statistical significance was set at 95% confidence interval (<0.05).

Results: A total of 181 participants were studied with a mean age of 54±15.7 years.

Table 1: Pattern of symptoms of dry eye disease among 181 glaucoma patients using Ocular Surface Disease Index (OSDI) Questionnaire

SYMPTOM	PRESENT(%)	ABSENT(%)	TOTAL
Ocular symptoms			
Blurred Vision	98(54.1)	83(45.9)	181
Gritiness	92(50.8)	89(49.2)	181
Sensitive to light	67(37)	114(63)	181
Painful or sore eyes	62(34.3)	119(65.7)	181
Poor vision	48(26.5)	133(73.5)	181
Vision related symptoms			
Discomfort with: Reading	56(30.9)	125(69.1)	181
Driving at night	54(29.8)	127(70.2)	181
Working with a computer	44(24.3)	137(75.7)	181
Watching television	36(19.9)	145(80.1)	181
Environmental triggers:			
Windy conditions	37(20.4)	144(79.6)	181
Dry areas	20(11)	161(89)	181
Air conditioned room	17(9.4)	164(90.6)	181

There were 115 (63.5%) females with a female-to-male ratio of 1.74:1. The prevalence of dry eye disease was found to be 40.9%. Grittiness (51%) and blurring (54%) of vision were the most common presenting symptoms (Table 1). Older age, female gender, longer duration of drug administration and mean deviation were found to be statistically significantly associated with a diagnosis of DED (Table 2).

Table 2: Binary logistic regression for predictors of dry eye disease among glaucoma patients in Ahmadu Bello University Teaching Hospital, Zaria

		B	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	**Age**		0.006			
	40-59 Years	1.036	0.274	2.818	0.440	18.060
	60-69 years	1.583	0.0101	4.8730	0.736	32.25
	80 and above	2.326	0.014	10.237	1.603	65.362
	Female	-0.721	0.049	2.486	0.230	5.028
	Duration of Diagnosis >4 years)	-0.593	0.028	1.553	0.258	3.186
	Treatment regimen		0.434			
	Timolol	-0.153	0.854	0.858	0.169	4.364
	Brimonidine	1.094	0.280	2.988	0.410	21.771
	Timolol+Dorzalamide	0.397	0.689	1.487	0.213	10.366
	Timolol+Travoprost	0.105	0.894	1.110	0.238	5.182
	Timolol+Brimonidine	0.636	0.487	1.890	0.314	11.381
	Timolol+D+T	2.180	0.062	8.848	0.900	87.041
	Timolol+D+B	0.196	0.803	1.216	0.260	5.685
	Treatment period (> 5 years)	1.860	0.003	6.425	1.872	22.055
	Mean deviation		0.007			
	Moderate	1.281	0.008	3.599	1.388	9.333
	Severe	1.367	0.004	3.925	1.561	9.866
	Constant	-3.546	0.008	0.029		

D- Dorzalamide; T- Travoprost; B- Brimonidine

Discussion: The commonest presenting symptoms of dry eye disease in this study were blurred vision (54 %) and grittiness (51%). This differs from the study by Sarimiye et al[8] that reported stinging (38%) and burning (25%) as predominant complaints. While Pisella et al[9] in a multicenter study of 4107 patients in France documented 'discomfort' as the most common symptom. There was higher propensity of dry eye disease among those 60-79 years (Odds ratio 4.9) and 80 years and older (Odds ratio: 10) compared to those below 40 years in this study. This finding was corroborated by Fetchner et el[4] in their study. Gender also had a significant association with DED. This is consistent with other studies.[10,11]Duration of treatment of glaucoma with topical antiglaucoma medications was significantly associated with DED and this is corroborated by other studies.[12,13]

Conclusion: Dry eye disease is a common association of topical antiglaucoma medications; it predominantly presents with

blurred vision and grittiness. Identified risk factors include: Older age, female gender, increased duration of drug use and severity of glaucoma. The assessment and treatment of dry eye disease should be integrated in the management of glaucoma to ensure total ocular care of these patients. The screening for dry eye disease should be periodic to ensure early diagnosis and treatment.

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