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Eyes on Antipsychotics: Analysing Dry Eyes in Long Term Users

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Introduction: Dry eye disease (DED), increasingly prevalent globally, is a chronic ailment that can lead to blindness in some individuals. In addition to systemic factors, medications and environmental conditions can modify the properties of the tear film which is crucial for preserving the integrity of the ocular surface. Antipsychotic drugs frequently administered in psychiatric care for conditions like psychoses and delusional disorder, often result in multiple side effects due to lifelong medication usage. There is heightened sensitivity of the human eye to these psychiatric treatments. Dry eyes is a known side effect of antipsychotic medication but is commonly disregarded due to its non specific symptoms, Therefore, this study aims to assess the prevalence of dry eye among patients undergoing chronic antipsychotic therapy. Materials and methods: It is a cross sectional observational study done on 120 eyes of 60 patients on chronic antipsychotic therapy who visited the psychiatry OPD in Saveetha medical college and hospital for a period of 3 months from January 2024 - April 2024. Ocular Examination was done which included best corrected visual acuity (BCVA) as determined by the Snellens Chart, slit lamp biomicroscopy & dilated fundus examination using 90D and 78 D lenses. Dry eye evaluation was done using Schirmer's I test, Tear film meniscus height test ,Tear film break up time (TBUT) and Fluorescein staining and the results were recorded. Patients with Schirmer's test value below 10mm were considered as having dry eyes. Results: In our study of 60 patients who were on chronic antipsychotic therapy, 32 patients were males and the remaining 28 were females. 33 patients (55 %) patients were in the age group of 40-60 years, 18 patients (30%) in 20-40 years age group and 15 % in the age group of <20 years. 32 patients (53 eyes) out of 60 patients were identified to have dry eyes based on Schirmer's I test. Of the 32 patients only 15 (47%) patients were symptomatic. Foreign body sensation was the most common presenting symptom. 64.1% patients showed Grade 2 dry eyes. Tear film meniscus height test was abnormal in 45 eyes (85%) and TBUT test was abnormal in 30 eyes (56.6 %) with dry eyes. Blink rate was reduced in all patients with dry eyes with the mean value of 8 per minute. 62.5% patients with dry eyes were on antipsychotic therapy for > 8 years. 83.3% patients on polytherapy had dry eyes. Conclusion: Appropriate and timely management can aid in preventing dry eye related complications if diagnosed earlier. Hence this study highlights the need to evaluate patients for dry eyes who are on chronic antipsychotic medications even if patients are asymptomatic and especially if they are on polytherapy.

Keywords: Dry eye disease (DED), Tear film break up time (TBUT), polytherapy.

1. Introduction

Dry eye disease could be caused by multiple factors which causes ocular discomfort, decreased vision and tear film instability due to damage to the ocular surface. It is characterised by hyperosmolarity of the tear film and inflammation of the ocular surface. [1,2] Antipsychotic drugs frequently administered in psychiatric care for conditions like psychoses and delusional disorder, often result in multiple side effects due to lifelong medication usage. There is heightened sensitivity of the human eye to these psychiatric treatments. Moreover antipsychotic medications could affect the quantity and quality of the tears. Hence it is possible that any drug having these characteristics might reduce the amount of tears produced.[3]

Dry eye disease (DED) affects between 5% and 34% of people worldwide. The hyperosmolarity of the tear film and inflammation of the lacrimal gland and ocular surface are among its presumed pathogenetic mechanisms. Clinically speaking, there are two subtypes of dry eye: hyperevaporative DED (which has excessive tear evaporation) and aqueous deficient DED (which has decreased tear secretion) [4,5].

Psychotropic medications may have a variety of negative effects on the eyes, depending on their peculiarities, dosages, and interactions with particular bodily organ systems. The phenothiazine family is the most studied group of psychotropic chemicals in conventional antipsychotics. There is a chance that the phenothiazine class will cause adverse effects related to the eyes and skin [6] Chlorpromazine, a phenothiazine can cause chlorpromazine-related epithelial keratopathy as well as chlorpromazine-related abnormal pigment accumulations. [7,8]

Antipsychotic drugs are frequently prescribed in psychiatric settings for patients with delusional disorders and psychoses. These people frequently have adverse effects since they take the medications throughout their lives. The organ most frequently affected by antipsychotic drugs is the liver followed by eyes. Every psychotropic drug has the potential to cause a wide range of undesirable ocular side effects. [9] Ocular adverse effects include oculogyric crises, corneal drug deposition, corneal blurriness, stellate capsular deposits and dry eyes among others. [10] Dry eye illness frequently goes untreated, which causes patients to suffer greatly because dry eyes if not timely intervened could even cause blindness. Hence our study aim is to analyse tear film in patients receiving antipsychotic therapy for more than two years.

2. MATERIALS AND METHODS

It is a cross sectional observational study done on 120 eyes of 60 patients on chronic antipsychotic therapy who visited the psychiatry OPD in Saveetha medical college and hospital for a period of 3 months from January 2024 - April 2024.

INCLUSION CRITERIA:

- Patients on antipsychotics for more than or equal to 2 years.

EXCLUSION CRITERIA:

- Patients on antipsychotics for lesser than 2 years.
- Patients on other medications along with antipsychotics that could cause dry eyes.
- Patients with other ocular surface diseases.
- Patients with other systemic comorbidities including diabetes, hypertension and other ocular diseases including glaucoma, retinopathies and corneal pathologies.
- Patients who are already on dry eyes treatment

The study was initiated after taking approval from the ethics committee. Informed and consent in their native language were taken from patients willing to be included in the study. Ocular Examination was done which included best corrected visual acuity (BCVA) as determined by the Snellens Chart, slit lamp biomicroscopy & dilated fundus examination using 90D and 78 D lenses. Dry eye evaluation was done using Schirmer's I test, Tear film meniscus height test,Tear film break up time (TBUT) and Fluorescein staining and the results were recorded. Patients with Schirmer's test value below 10mm were considered as having dry eyes.

STATISTICAL ANALYSIS

The statistical analysis was performed using IBM SPSS Statistics v23.0. The qualitative variables were expressed as numbers and percentage. Chi Square test were used to analysis the results. $P \leq 0.05$ was considered statistically significant.

3. RESULTS

In our study of 60 patients who were on chronic antipsychotic therapy, 32 patients were male and the remaining 28 were females. 33 patients (55 %) patients were in the age group of 40-60 years, 18 patients (30%) in 20-40 years age group years and 15 % in the age group <20 years as shown in Table 1.

Table 1: Age wise distribution

AGE GROUP	NUMBER OF PATIENTS (N=60)	PERCENTAGE (%)
<20 years	9	15%
20-40 years	18	30%
40-60 years	33	55%
Total	60	100%

32 patients (53 eyes) out of 60 patients were identified to have dry eyes based on Schirmer's I test. Among the patients with dry eyes, 20 patients were females (62.5%) and 12 patients were males (37.5%). Of the 32 patients only 15 (47%) patients had the following presenting symptoms as shown in Table 2.

Table 2: Presenting symptoms

SYMPTOMS	NUMBER OF PATIENTS	PERCENTAGE
No symptoms	17	53.1 %
Foreign body sensation	6	18.8%
Irritation	3	9.4 %
Photophobia	1	3.1 %
Redness	1	3.1 %
Watering	4	12.5 %
Total	32	100%

The grading of dry eyes was done based on DEWS dry eye severity grading scheme with majority of patients showing Grade 2 dry eyes severity as shown in Table 3. [11]

Table 3: Grading of Dry Eyes

DEWS SEVERITY GRADING	NUMBER OF EYES WITH DRY EYES N=53 (%)
1	15 (28.3%)
2	34 (64.1%)
3	3(5.6 %)
4	1 (2 %)

Tear film meniscus height test was abnormal in 45 eyes (85%) and TBUT test was abnormal in 30 eyes (56.6 %) with dry eyes. Blink rate was reduced in all patients with dry eyes ranging with the mean value of 8 per minute.

Among the 9 patients on antipsychotic therapy for less than 5 years, 11.1 % patients had dry eyes, 55.6% patients had dry eyes among the 18 patients on antipsychotic therapy for 5-8 years and 63.6% patients had dry eyes among the 33 patients on antipsychotic therapy for > 8 years and the values were statistically significant ($p<0.05$) as shown in Table 4.

Table 4: Duration of drug therapy by using chi square test

DURATION	PATIENTS WITH DRY EYE DISEASE (N=60)		P value
	PRESENT	ABSENT	
<5 Years	1 (11.1 %)	8 (88.9%)	0.019*
5-8Years	10 (55.6%)	8 (44.4%)	
>8 Years	21 (63.6 %)	12 (36.4%)	
Total	32	28	

*p<0.05 – statistically significant, ns- not significant

Around 22 patients (36.75%) were on monotherapy, 32 patients (53.3 %) were on dual therapy and 6 patients (6.7%) were on polytherapy. 31.8% patients on monotherapy had dry eyes, 62.5% patients on dual therapy had dry eyes and 83.3% patients on polytherapy had dry eyes and the values were statistically significant ($p<0.05$) as shown in Table 5. Of the monotherapy drugs most patients with dry eyes were on chlorpromazine (57%).

Table 5: Dry eye disease among different treatment groups

TREATMENT	PATIENTS WITH DRY EYE DISEASE(n=60)		P value
	PRESENT	ABSENT	
Monotherapy	7 (31.8%)	15 (68.2%)	0.025*
Dual therapy	20 (62.5%)	12 (37.5%)	
Polytherapy	5 (83.3 %)	1 (16.7%)	
Total	32	28	

*p<0.05 – statistically significant, ns- not significant

4. DISCUSSION

Dry eye is a chronic condition that is spreading throughout the world, with some people developing blindness as a result. Therefore, improved understanding of the condition and better methods of care will enable the doctor to assist these individuals in resolving their ongoing issue and preserving their visual acuity.
In our study female preponderance was noted in patients with dry eyes. This could be attributed to the fact that the female sex is a risk factor for dry eye disease [12]. Majority of the patients were in the age group of 40-60 years. We also noted that nearly 53.1 % patients with dry eye disease were asymptomatic as comparable to study by Alqurashi A et al. [13] where 48% of the studied population did not complain of dry eyes symptoms.

In our study 64.1 % of patients were diagnosed with Grade 2 disease according to the Dry Eye Illness Staging System (DEWS). This was in comparison to a study conducted by Dimple et al. [14] 56.6% patients with dry eyes had abnormal TBUT test which is comparable to a study by Balogun MM et al. which showed abnormal values in 50.8% of patients with dry eyes.[15] Blink rate is reduced in patients with dry eyes as compared to normal eyes. [16] Our study also revealed reduced blink rate with mean value of 8 per minute in patients with dry eyes.

In our study, 33 out of 50 patients are on anti-psychotic medications for more than 8 years and 63.6% of patients in that group had dry eye disease, which is similar to the study conducted by Dimple et al. [14] in which patients on prolonged duration of antipsychotics had increased prevalence of dry eyes.

Patients on two or more drug regimen showed more prevalence of dry eyes than on mono drug regimen in our study. Nearly 83.3% patients on a polytherapy experienced dry eye disease as compared to only 31.8% patients with dry eyes in patients with monotherapy which is comparable to study conducted by Babu M et al. [17]

Mechanism by which antipsychotics cause dry eyes could be explained by its anticholinergic effects on conjunctiva and lacrimal glands causing reduced tear secretion. This leads to persistent instability of the tear film which may result in ocular surface problems and reduced vision. [16] Regular screening of patients on antipsychotics and starting them on lubricants and tear rehabilitating agents is recommended to preserve vision in future. [18]

5. CONCLUSION

Appropriate and timely management can aid in preventing dry eye related complications if diagnosed earlier. Hence this study highlights the need to evaluate patients for dry eyes who are on chronic antipsychotic medications even if patients are asymptomatic and especially if they are on polytherapy.

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