TEAR FILM ANALYSIS IN PATIENTS ON CHRONIC ANTI-PSYCHOTIC THERAPY

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ABSTRACT

BACKGROUND

Dry eye disease is a well-known side effect of antipsychotic therapy which is often neglected due to nonspecific symptoms. Therefore, this study is to analyse tear film dysfunction in patients on chronic antipsychotic therapy.

MATERIALS AND METHODS

Study was undertaken on 200 eyes of 100 patients who were on chronic anti-psychotic therapy attending the Psychiatry OPD. Out of 100 patients, 65 patients were male, rest 35 were females. Ocular examination was done on all patients which included BCVa, slit lamp evaluation and dry eye evaluation.

RESULTS

32 out of 100 patients on chronic anti-psychotic therapy had dry eye disease. 17 (53.13%) out of these 32 patients had symptoms suggestive of dry eye disease. Patients on typical antipsychotics and multidrug regimen showed more prevalence of dry eye.

CONCLUSION

Nearly 40% patients were in Grade 3 category of dry eye disease, which if not treated on time can lead to further progression and complication of disease. Patients may not come out with symptoms of ocular diseases so it is mandatory to screen these patients to diagnose early and to prevent complications. This study emphasizes on the need to give importance to patients symptoms so that it can be detected earlier before it progresses.

KEYWORDS

Dry eye, Prevalence, Antipsychotic Therapy, Tear Film Analysis, Polypharmacy.

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BACKGROUND

DEWS Definition (2007)- Dry eye disease is a multifactorial disease of the tear film and ocular surface that results in symptoms of discomfort, visual disturbance, and tears film instability with potential damage to the ocular surface. It is accompanied by increased osmolality of tear film and inflammation of the ocular surface. Keratoconjunctivitis sicca refers to any eye with some degree of dry eye.[1] In recent years, dry eye disease has become common condition that causes varying degrees of ocular discomfort and disability. Anti-psychotic agents are very commonly used medications in a Psychiatry setup for patients suffering from Psychoses and Delusional disorder. As these patients are on medications all through their life, side effects are seen very commonly in them.[2] Liver is the organ most commonly affected by Anti-psychotic medications, followed by eyes. Ocular side effects include blurring of vision, dry eye, corneal deposition of drugs, stellate capsular deposits, oculogyric crisis etc. Of these many ocular side effects, Dry eye disease, often does not get proper attention and thus, leads to great discomfort to the patients. This study aims at dealing with this particular side effect, dry eye of antipsychotic agents.

Aim and Objectives- The aim of the study is to determine the disturbance in tear film due to chronic usage of Anti-psychotic medications in patients attending the Psychiatry OPD, Govt. Stanley Medical College and Hospital.

1. To determine the prevalence of dry eye disease in patients on chronic anti-psychotic therapy.
2. To determine the association between duration of therapy and dry eye disease.
3. To determine the association of poly-pharmacy with dry eye disease in these patients.

MATERIALS AND METHODS

It is a observational study undertaken on 200 eyes of 100 patients who were on chronic anti-psychotic therapy attending the Psychiatry OPD. Out of 100 patients, 65

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patients were male, rest 35 were females. 76 patients were on treatment for schizophrenia, 15 had Delusional disorder and 9 had Psychoses- not specified otherwise. History regarding Anti-psychotic drug usage, its dosage and duration was obtained from the patients and care-takers. Ocular examination included best corrected visual acuity by Snellen's Chart, Slit lamp examination & dilated fundus examination 90D and 20D, dry eye evaluation included Schirmer's 1 test, Tear film height, Tear film break up time and Fluorescein staining.

Inclusion Criteria

- Patients on Anti-psychotic medications for more than 2 years.

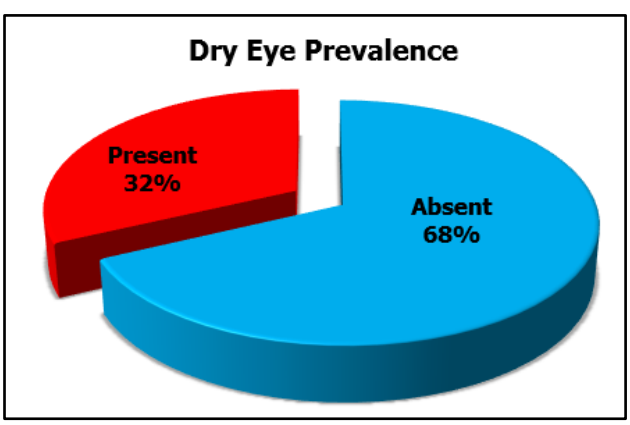
Exclusion Criteria

- Patients on Anti-psychotic medications for less than 2 years.
- Patients who had an acute episode of the disease.
- Patients on other medications along with Anti-psychotics.
- Patients with other ocular morbidities which can affect tear film.
- Other systemic diseases.

RESULTS

32 out of 100 patients on chronic anti-psychotic therapy had dry eye disease.

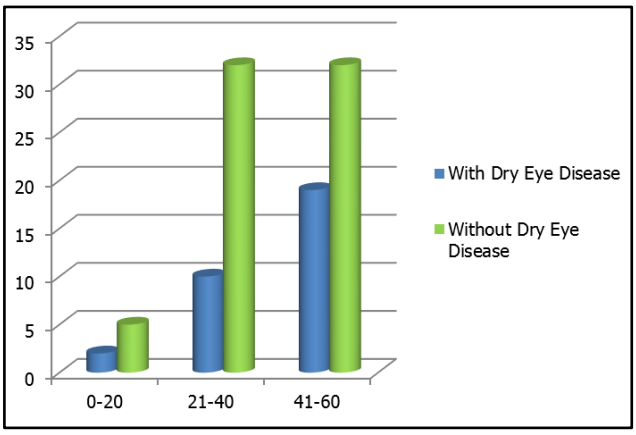
17 (53.13%) out of these 32 patients had symptoms suggestive of dry eye disease.



Graph 1. Dry Eye Prevalence

Age Groups	Number of Patients with Dry Eye Disease	Number of Eyes with Dry Eye Disease
< 20	3	4 (6.7%)
21-40	10	19 (32.2%)
41-60	19	36 (61.01%)
Total	**32**	**59**
Table 1. Age Distribution		

Most of the patients with dry eye disease belonged to the age group of 41-60 years constituting 61% of total eyes with dry eye disease.

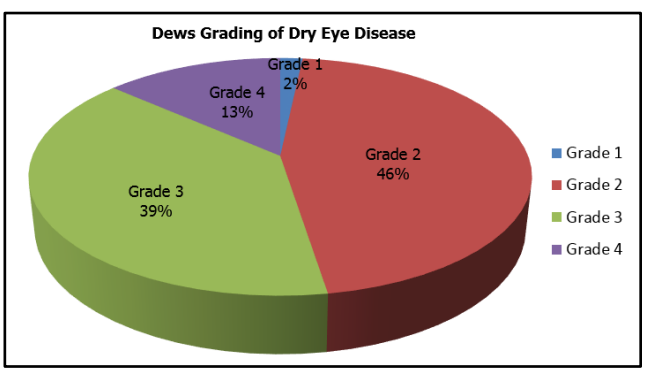


Graph 2. Age-Wise Distribution of Dry Eye Disease

Grading of Dry Eye Disease- 59 out of 200 eyes had dry eye disease. 5 patients out of 32 had unilateral dry eye disease.

Dews Severity Grading	Number of Eyes
1	1 (1.6%)
2	27 (45.76%)
3	23 (38.98%)
4	8 (13.55%)
Total	**59**
Table 2. Grading of Dry Eye Disease	

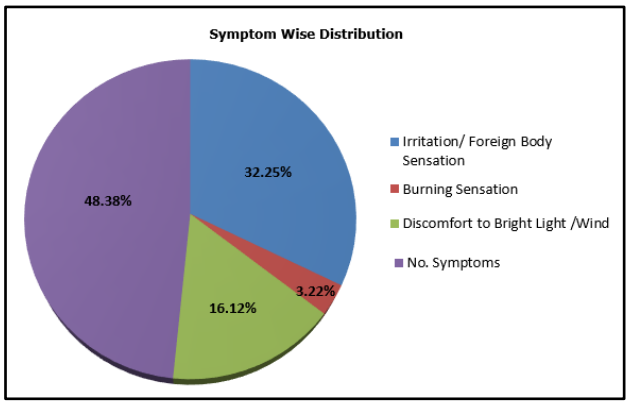
27 (45.7%) eyes out of 59 eyes diagnosed with dry eye had Grade 2 dry eye disease.



Graph 3. Dews Grading of Dry Eye Disease

Symptoms	Number of Patients with Dry eye
Irritation/Foreign Body Sensation	10 (31.25%)
Burning Sensation	2 (6.25%)
Discomfort To Bright Light/ Wind	5 (15.62%)
No Symptoms	15 (46.87%)
Total	**32**
Table 3. Symptoms	

17 (53.13%) out of 32 patients with dry eye disease had symptoms. As most of the patients were in Grade 3 dry eye disease category, we should definitely evaluate these patients even if they are asymptomatic.



Graph 4. Symptom Wise Distribution

Tear Film Meniscus Height	Number of Eyes with Dry Eye
Abnormal	55 (93.2%)
Normal	4 (6.8%)
Total	**59**
Table 4. Tear Film Meniscus Height	

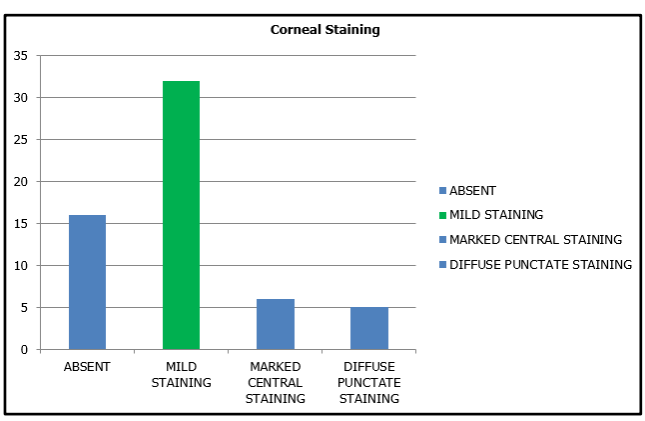
Tear film height was abnormal in 55 (93.2%) out of 59 eyes with dry eye disease

Conjunctival Injection	Number of Eyes with Dry Eye
Absent	47 (79.66%)
Present	12 (20.33%)
Total	**59**
Table 5. Conjunctival Injection	

Conjunctival injection was absent in 47 out of 59 eyes that constitutes nearly 79.66% of positive cases.

Corneal Staining	Number of Eyes with Dry Eye
Absent	16 (27.11%)
Mild Staining	32 (54.3%)
Marked Central Staining	6 (1.01%)
Diffuse Punctate Staining	5 (0.84%)
Total	**59**
Table 6. Corneal Staining	

Nearly 43 (72.89%) out of 59 eyes with dry eye showed corneal staining with fluorescein. Most of the patients had mild corneal staining.



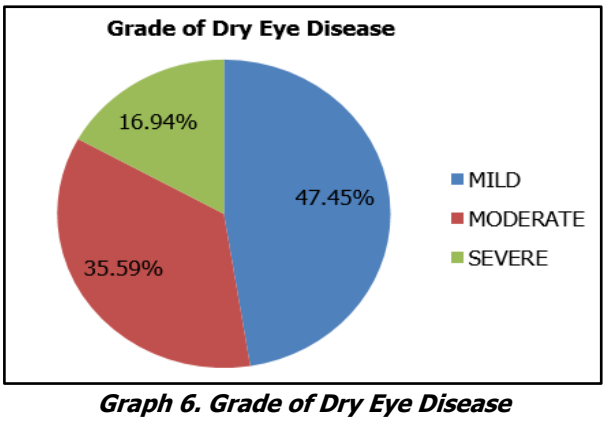
Graph 5. Corneal Staining

TBUT	Number of Eyes with Dry Eye
Abnormal	38 (64.4%)
Normal	21 (35.6%)
Table 7. Tear Film Breakup Time	

38 (64.4%) out of 59 eyes with dry eye disease had abnormal tear film break up time.

Schirmer's Test 1 (in mm Hg)	Grade of Dry Eye Disease	Number of Eyes with Dry Eye
6-10	Mild	28 (47.45%)
3-5	Moderate	21 (35.59%)
0-2	Severe	10 (16.94%)
Total		**59**
Table 8. Schirmer's Test 1		

Most of the patients had mild dry eye disease, 28 (47.45%) out of 59 eyes.



Graph 6. Grade of Dry Eye Disease

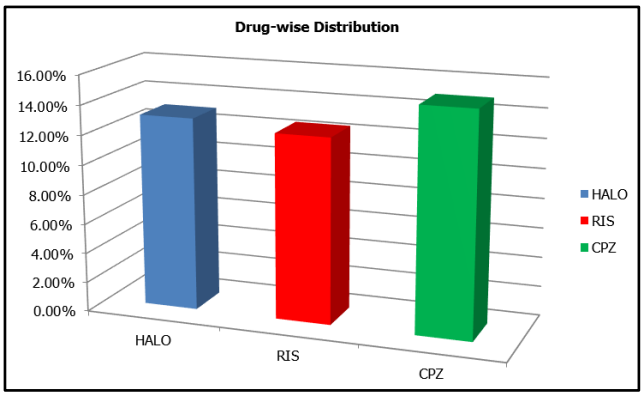
Drug wise Distribution of Disease

The most commonly used Anti-Psychotic drugs in our setup is Chlorpromazine, Haloperidol and Risperidone. Chlorpromazine and Haloperidol are the Typical Anti-Psychotic agents, while Risperidone falls in a relatively newer category of Atypical Anti-psychotic agents. Of the 100 patients evaluated, 20 were on Chlorpromazine, 23 on Haloperidol and 16 on Risperidone. Out of 20 patients who were on Chlorpromazine, 3 (15%) had dry eye disease. Of the 16 patients on Risperidone, 2 (12.5%) patients had dry eye disease and Out of 23 patients who were on Haloperidol, 3(13.04%) patients had dry eye disease.

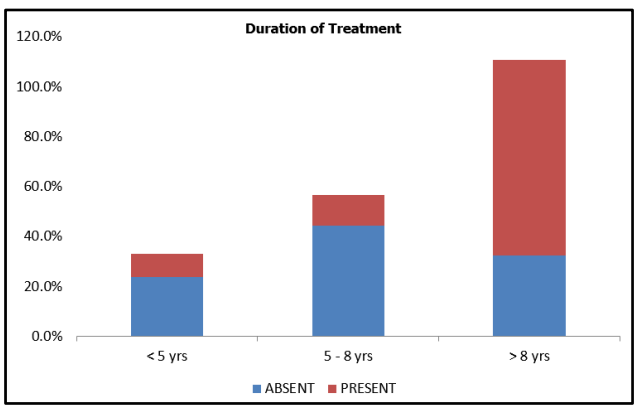
On comparison, the prevalence of dry eye disease showed following order: Chlorpromazine >Haloperidol >Risperidone.

43 patients out of 100 were on Typical anti-psychotics. Of these, 6 (13.95%) patients had dry eye disease. Of the 16 patients on Atypical anti-psychotics, 2 (12.5%) had dry eye indicating more prevalence of dry eye disease in patients on Typical Anti-psychotics than on Atypical agents.

Duration	Dry Eye Disease		Total
	Present	Absent	
<5 Years	3 (9.4%)	16 (23.5%)	19
5-8 Years	4 (12.5%)	30 (44.1%)	34
>8 Years	25 (78.1%)	22 (32.4%)	47
Total	**32**	**68**	**100**
Table 9. Duration of Drug Therapy			



Graph 7. Drug-wise Distribution



Graph 8. Duration of Treatment

Nearly 78% of the patients found to have dry eye disease were on treatment with anti-psychotic agents for more than 8 years.

Mono-Pharmacy vs Poly-Pharmacy- Of the 100 patients, 60 were on mono drug therapy. Rest 40 were on multi-drug therapy.

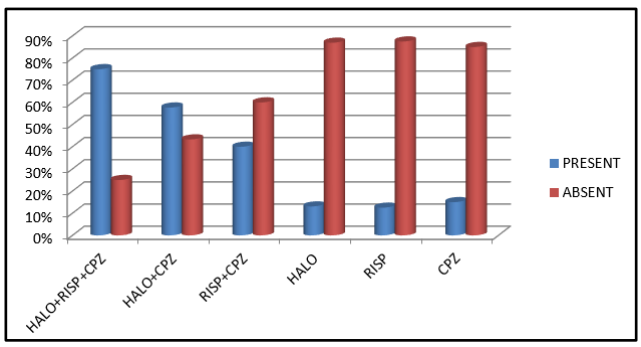
In the Multi-drug group, a combination of Haloperidol, Chlorpromazine and Risperidone was used by 4 patients, 26 patients were on Haloperidol and Chlorpromazine and 10 patients were on Risperidone and Chlorpromazine combination.

Treatment	Dry Eye Disease		Total
	Absent	Present	
Mono Drug Therapy	51 (75%)	9 (28.1%)	60
Dual Drug Therapy	16 (23.5%)	20 (62.5%)	36
Multi Drug Therapy	1 (1.5%)	3 (9.4%)	4
Total	**68**	**32**	**100**

Table 10. Monopharmacy Versus Polypharmacy

Drug Regimen	Dry Eye Disease		Total Eyes
	Present	Absent	
Halo+Risp+Cpz	6 (75%)	2 (25%)	8
Halo+Cpz	30 (57.69%)	22 (43.31%)	52
Risp+Cpz	4 (40%)	16 (60%)	20
Halo	6 (13.05%)	40 (86.95%)	46
Risp	4 (12.5%)	28 (87.5%)	32
Cpz	3 (15%)	17 (85%)	20
Total	**59**	**141**	**200**

Table 11. Drug Combination and Dry Eye Disease



Graph 9. Drug Combination and Dry Eye Disease

DISCUSSION

32 patients out of 100 patients on anti-psychotic medications for more than 2 years had dry eye disease. Of the 200 eyes evaluated, 59 eyes were found to have dry eye disease. 61.01% of the eyes with dry eye disease were between 41-60 years of age and on treatment. Typical antipsychotics (13.95%) showed more prevalence of dry eye disease than Atypical antipsychotics (12.5%). Patients on Multidrug regimen showed more prevalence of dry eye than on mono drug regimen. Dry eye disease is multifactorial disease of tear film and ocular surface that results in symptoms of discomfort, visual disturbance and tear film instability with potential damage to ocular surface.[3] It is accompanied by increased osmolarity of tear film and inflammation of ocular surface. Dry eye is a chronic disease becoming commoner among the people all over the world, some of whom become blind as sequelae. So, a better knowledge of the disease and better mode of treatment would aid the physician to help these patients to overcome this chronic problem and maintain a good visual acuity. Anti-psychotic agents are very commonly used medications in a Psychiatry setup for patients suffering from Psychoses and Delusional disorder. As these patients are on medications all through their life, side effects are seen very commonly in them. Eye is the second most commonly affected organ by Anti-psychotic medications. Ocular side effects include blurring of vision, dry eye, corneal deposition of drugs, stellate capsular deposits, oculogyric crisis etc..[4] Of these many ocular side effects, Dry eye disease, often does not get proper attention and thus, leads to great discomfort to the patients. Possible mechanism suggested is – Due to the anti-cholinergic action of these drugs, they block the muscarinic receptors present over lacrimal gland. This decreases the tear secretion leading to an unstable tear aqueous layer. And that is the reason for aqueous deficiency and dryness of eyes.[5] According to a study by McIntosh et al, the schizophrenic patients on neuroleptics showed decreased blink rate which may be another cause of dry eye in these patients.[6]

Antipsychotic medication, exhibits anticholinergic side effects by blocking muscarinic and nicotinic receptors, and muscarinic-3 receptors in the conjunctiva and lacrimal gland as well. This leads to decreased mucous and aqueous secretion.[7] Persistent tear film instability can lead to morphological and biomechanical changes at the cellular level, ultimately affecting the ocular surface and

vision.[8] Prompt lubrication and use of tear rehabilitating agents as cyclosporine can prevent desiccation.[9]

Chlorpromazine has been found to cause corneal epithelial keratopathy. It has a distinctive pattern of fine streaks or swirling lines in the epithelium. This has been linked to high dosages (>2g/day) of the drug. This causes minimal visual consequences and usually regresses with dose tapering.[10]

CONCLUSION

32 out of 100 patients on anti-psychotic medications for more than 2 years had dry eye disease. Of the 200 eyes evaluated, 59 eyes were found to have dry eye disease. It was found to be more common in people between 41-60 years of age. Nearly 40% patients were in Grade 3 category of dry eye disease, which if not treated on time can lead to further progression and complication of disease. The patients who had taken anti-psychotic medications for more than 8 years, especially those who were on multi-drug regimen showed significant preponderance for dry eye disease. Inspite of the patient's complaints of ocular discomfort, it is difficult to rely on it considering their general state of mind. Our study however emphasizes on the need to give importance to patient's symptoms, so that it can be detected earlier before it progresses.

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