



A CLINICAL STUDY OF DRY EYE

Dr. M.Madhavi	M.S; Assistant professor of ophthalmology, SMC, Vijayawada.
Dr. Zamrudh Shahin	M.S; Senior Resident of ophthalmology, SMC, Vijayawada.
Dr. G.S. Ramesh Kumar	M.S; Professor & HOD of ophthalmology, SMC, Vijayawada.
Dr. V.M.V.R.V. Prasada Rao	M.S; Professor of ophthalmology, SMC, Vijayawada.

ABSTRACT

A clinical study was conducted in the out patient department of Siddhartha medical college, Government general hospital, Vijayawada, for a period of one year from December 2015 to November 2016. 70 patients who were symptomatic were enrolled in this study. They were given an OSDI questionnaire, examined for signs of dry eye and subjected to three tests (Schirmer test, Tear film break up time, rose bengal test), based on which they were labeled positive or negative for dry eye.

OBJECTIVES:

1. To determine the prevalence of dry eye in symptomatic patients attending the Ophthalmology OPD SMC, Vijayawada.
2. To evaluate the clinical features, diagnostic tests and treatment of dry eye disease.

KEYWORDS : Dry eye, Ocular Surface Disease Index(OSDI), Schirmer's test, Rose Bengal test, TBUT.

INTRODUCTION

Dry eye is a disorder of tear film due to tear deficiency or excessive tear evaporation which causes damage to the interpalpebral ocular surface and is associated with symptoms of ocular discomfort.

The term 'dry eye' can be attributed to the Swedish Ophthalmologist Henrik Sjogren, who described the triad of dry eye, dry mouth, and joint pains in the year 1933. The term used commonly to denote dry eye in clinical practice is "keratoconjunctivitis sicca". These disorders are associated with such symptoms of ocular discomfort as irritation, foreign body sensation, or redness, and may cause disease of the ocular surface.

Dry eye is a chronic, multifactorial condition characterized by disturbances in the tear film and the ocular surface. It can be caused by deficiency of any one or more of the tear film components, or can be a component of systemic diseases, including Sjogren's syndrome, lupus and Stevens-Johnson syndrome. Additionally, factors such as contact lens wear and adverse environmental exposures such as arid environments, windy conditions or visual tasking can exacerbate the symptoms of dry eye. Also prevalence of dry eye increases with age. It is estimated that nearly 75% of people over 65 will experience dry eye syndrome.

Dry eye disease is one of the most common reasons for patients to visit an eye care professional. With the number of patients presenting with symptoms of dry eye ever increasing, the continuously changing lifestyle and environment. However a better understanding of the key and important presenting symptoms, the external and systemic factors contributing to dry eye and the ideal battery of tests for dry eye will help in early diagnosis of this chronic condition, with more efficient and effective treatment and long term patient satisfaction.

OBJECTIVES

1. To determine the prevalence of dry eye in symptomatic patients attending the Ophthalmology OPD SMC, Vijayawada.

2. To evaluate the clinical features, diagnostic tests and treatment of dry eye disease.

METHODOLOGY**STUDY:**

The study was conducted on 70 patients who presented with symptoms suggestive of dry eye. It was a one year cross sectional study with the study period ranging from December 2015 to November 2016.

Patients who satisfied any one of the inclusion criteria were selected.

Inclusion criteria

Patients equal to and above 20yrs presenting with following symptoms.

- Burning sensation
- Sandy gritty feeling
- Foreign body sensation
- Photophobia
- Heavy lids.

The above symptoms increase in conditions of low humidity and wind.

Exclusion criteria

Patients less than 20yrs with h/o

- Increased mucoid discharge and watery secretion suggestive of vernal kerato conjunctivitis
- Alkali burns
- Trachoma
- Acute ocular infections
- Ocular surgery within last 6 months
- Impaired eyelid function like in bell's palsy, nocturnal lagophthalmos, ectropion
- Contact lens users

Of the 70 subjects who were included in the study, 4 had undergone cataract surgery in one of the eyes. That eye was

excluded and the other eye was considered for the study.

Written informed consent was taken before enrolling the patients in the study. An OSDI questionnaire was administered to all participants to assess the symptoms of dry eye and correlate them with the signs.

A complete slit-lamp examination of the lid margins, tear meniscus, conjunctiva, cornea and tear film was done. Relevant examination of other important ocular structures was done. Following this, tests to diagnose dry eye were performed. These are tear break up time (TBUT), rose bengal staining and schirmer's tests. Participants were labeled as having dry eye if at least two out of these three diagnostic tests were positive. This criteria of two diagnostic tests to diagnose dry eye was adopted in order to increase the detection rate of dry eye and hence arrive at an accurate prevalence.

RESULTS

Table 1: Characteristics of the study population

Characteristics	Number
Total number of patients	70(136)
Age group	>20 years
Schirmer's test positive	56 eyes
Tear film break up time positive	26 eyes
Rose Bengal test positive	51 eyes
Dry eye present(2 or more tests positive)	34 patients (56 eyes)
Dry eye absent	36 patients (80eyes)

Table 2 : Dry eye in relation to Age distribution

Age (years)	Dry eye present No. Of patients(%)	Dry eye absent No. Of patients(%)	Total No. Of patients(%)
21-30	0	5(100%)	5
31-40	6(31.5%)	13(68.42%)	19
41-50	8(53.53%)	7(46.66%)	15
51-60	12(60%)	8(40%)	20
61-70	8(72.72%)	3(27.27%)	11
Total	34	36	70

Table – 3: Dry eye in relation to sex distribution

Sex	Dry eye present	Dry eye absent	Total
Females	29(85%)	28	57
Males	5(15%)	8	13
Total	34	36	70

Table – 4: OSDI Scores

OSDI	No. Of patients
0	6
1-33	45
34-66	12
67-100	6
Total	70

Table – 5: OSDI scores and correlation with dry eye

OSDI scores	Dry eye present	Dry eye absent	Total no. Of eyes
0	0	12	12
1-33	39	50	89
34-66	7	16	23
67-100	10	2	12
Total	56	80	136

Table 6: Results of Schirmer's test

Schirmer's test	Dry eye present	Dry eye absent	Total
Positive	51	5	56
Negative	5	75	80
Total	56	80	136

Table 7: Distribution of patients according to Schirmer's test results.

Schirmer's (mm)	0-5	6-10	>10	Total
No. Of patients	20	11	39	70

% of patients	28.6	15.7	55.7	100
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Table 8: Results of tear film break up time (TBUT) test

TBUT	Dry eye present	Dry eye absent	Total
Positive	26	0	26
Negative	30	80	110
Total	56	80	136

Table 9: Results of Rose Bengal test

Rose Bengal test	Dry eye present	Dry eye absent	Total
Positive	48	3	51
Negative	8	77	85
Total	56	80	136

Table 10: Treatment in patients diagnosed with dry eye

Drugs	Dry eyes treated(percentage)
Artificial tears	46 eyes (82.14%)
Doxycycline	10 eyes (17.85%)

DISCUSSION:

- The total number of patients examined in our study was 70. The eyes included in the study were 136. The age group was between 21 to 70 years, with the mean age of the patients being 47.92 years.
- Of the total number of patients, 57 were females and 13 were males with a female to male ratio of 4.38:1. Among the entire group, 34 patients (56 eyes) were diagnosed to have dry eye based on the tests.
- The entire study population was divided decade wise into subgroups and the relationship of age with dry eye prevalence was studied. The youngest patient was of 21 years and the oldest was 65 years. Mean age was 47.96+ _11.55 years.
- The ocular surface disease index (OSDI) was administered to the patients before subjecting them to examination or tests. Of the entire study group, 27.1% responded with symptoms of moderate to severe dry eye.
- The eyes of the patients showing positive symptoms were then analyzed and the symptoms were compared with the signs to look for correlation between symptoms and signs.
- A total of 56(41.17%) eyes gave a wetting of less than 10mm on performing the Schirmer's test. Among these, 51 were proved to be positive for dry eye based on pre-determined diagnostic criteria. The Schirmer's test showed a sensitivity of 91.1% and specificity of 93.7%. The positive predictive value of the test was found to be 91.07% and the negative predictive value was 93.7%.
- Among the 31 patients who gave a positive result for dry eye based on the schirmer's test in one or both eyes, 20 patients(28.6%) had a wetting of less than or equal to 5mm. The rest i.e. 11 patients(15.7%) had wetting of between 6 to 10mm in one or both eyes, which is indicative of mild to moderate dry eye.
- TBUT was the second test to be performed. It was found to be positive (<10 seconds) in 26 eyes(19.11%). All the eyes which gave a positive result showed objective evidence of dry eye. This test was found to have a sensitivity of 46.4% and specificity of 100%. Its positive predictive value was 100% and negative predictive value was 72.7%.
- A total of 51 eyes (37.5%), showed positive staining for Rose bengal. Among these, 48 eyes(94.1%) were positive for dry eye. The test was found to have a sensitivity of 85.7% and specificity of 96.2%. The positive predictive value of the test was 94.1% and negative predictive value was 90.6%.

- Out of 56 eyes 46 were treated with Artificial tears. 10 eyes with meibomian gland disease were treated with only Doxycycline 100 mg twice daily for 3 weeks and then at follow up the dose was titrated depending on the response.
- Out of the 56 dry eye cases, 5 cases did not report for first follow-up. Out of the remaining 51 dry eye cases, 3 did not report for the 2 follow-up. A rise in OSDI score in 1-33 i.e. mildly symptomatic cases (74.5% during 3rd week of follow up and 81.2% during 6th week) was noted in follow-up. Patients who were moderate to severely symptomatic reported a fall in OSDI scores. 2.08% of the cases were totally symptom free at the end of 6 weeks.

Limitations of the study:

Since the duration of our study period is short significant improvement was seen only in subjective symptoms. Dry eye is a chronic disease which requires long term treatment and follow-up.

CONCLUSION

- Dry eye is an under-diagnosed ocular disorder. This is because diagnosis and assessment of dry eye are complicated by the considerable variation in disease symptoms and signs and lack of definitive diagnostic tests.
- Age of the patient is an important consideration as dry eye is more common in elderly.
- While considering a diagnosis of dry eye, attention should also be paid to other factors such as gender, presence of refractive error, associated systemic diseases like rheumatoid arthritis, as dry eye has positive correlation with these factors.
- Dry eye evaluation with an appropriate and standard questionnaire along with standard tests for dry eye helps in diagnosis and treatment. This will go a long way in the effective and successful management of patients with dry eye, specially so as the disease is chronic and needs long term treatment. Early and appropriate management will provide ocular comfort and satisfaction with a better quality of life.

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