



INFLUENCE OF AGE ON TEAR FILM STUDY

Ophthalmology

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ABSTRACT

AIM: To study the influence of age on tear production in adults.

MATERIAL AND METHODS: 900 normal people with equal distribution among males and females were studied. It is a prospective observational case series studied between June 2017 and June 2018. The tear film studies include Schirmer's Test and Break up time of tears (BUT).

RESULTS: Decreased levels of tears, as seen with decreased Schirmer's readings and reduced BUT, were seen more in females, worsening with age and were found to be statistically significant.

CONCLUSIONS: 1. Tear film production is reduced with increasing age. 2. BUT is more sensitive in detection of dry eye rather than Schirmer's test.

KEYWORDS

Schirmer's Test, Break Up Time, Tear Production, Age

INTRODUCTION:

The tear film coating the eye (precorneal tear film), has three distinct layers, from the most outer surface the Lipid layer, Aqueous layer and the Mucous layer. Dry eye is a disorder characterized by either quantitative decrease or qualitative change in pre corneal tear film resulting in spectrum of pathological changes that may adversely affect the ocular surface resulting in ocular surface disorders often leading to conjunctival squamous metaplasia and punctate epithelial erosion of cornea^{3,4}. The International Dry Eye Workshop (DEWS) report in 2017 defined dry eye as "a multifactorial disease of the ocular surface characterised by loss of haemostasis of tear film, and accompanied by ocular symptoms in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, neurosensory abnormalities play a etiological role"^{5,6}.

AIM: To study the influence of age on tear production in adults.

Materials And Methods: A total of 900 patients above the age of 20 years with equal distribution among males and females were studied. It was a prospective observational case series studied between June 2017 and June 2019.

Inclusion Criteria: All patients of either sex above the age of 20 years who did not complain of watering or dryness of eye and not suffering from ocular pathology and consented to participate in this study were recruited.

EXCLUSION CRITERIA:

Unwilling patients

Age less than 20 years

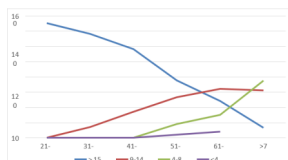
Patients with excessive lacrimation and dry eye.

The patients underwent visual acuity testing, complete anterior segment evaluation under slit lamp bio- microscopy and tests for tear film evaluation like Schirmer's test and tear film break up time (BUT) with interval of 30 minutes between the two tests. Schirmer's test reading more than 15 mm was taken as normal, 9-14 mm as mild, 4-8 mm as moderate and less than 4 mm as severe dry eye.

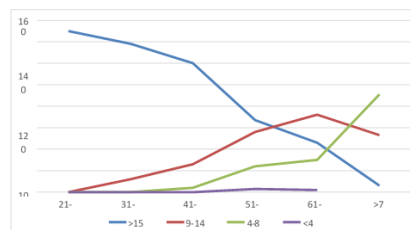
Tear film break up time (TBUT) more than 10 seconds was taken as normal, 5-10 seconds was taken as subnormal or dry eye, less than 5 seconds was taken as significant dry eye. The Schirmer's test results and the TBUT in seconds with the corresponding age groups were compared and the statistical analysis were derived using chi-square test.

RESULTS:

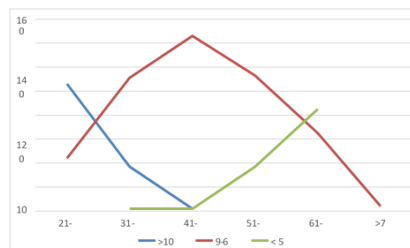
Graph1: the Distribution Of Schirmer's Test In Males



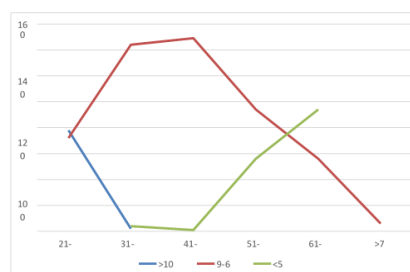
GRAPH2: THE DISTRIBUTION OF SCHIRMER'S TEST IN FEMALES



GRAPH3: THE DISTRIBUTION OF TBUT IN MALES



GRAPH4: THE DISTRIBUTION OF TBUT IN FEMALES



All the line diagrams above clearly show the decrease in the readings with increase in the age, female gender with Schirmer's test and TBUT.

DISCUSSION:

The effect of age on tear film is inversely proportional and it depends on several modifiable and non-modifiable factors ultimately leading to abnormal tear film tests on clinical examination. The present study was carried out on patients who were devoid of any symptoms of dry eye or tear film abnormalities if any. Dry eye is an under-diagnosed ocular disorder. Reduction in the modifiable risk factors of dry eye is essential to reduce its prevalence. In the present study the prevalence of dry eye using clinical tests in normal adult population was 40.9% on

Schirmer's test readings and 87.5% on tear film break up time. The prevalence was more common in females compared to males in the study. The present study found a lack of correlation between the symptoms and signs of dry eye. The prevalence of dry eye was found to be greater when objective testing was used and lower when symptoms only were used as diagnostic criteria. Female participants were found to be more likely to have dry eye than males. To avoid possible under-diagnosis, it is advised that objective clinical testing be carried out irrespective of whether the patient is symptomatic or not; this practice will facilitate more accurate and efficient diagnosis of the presence of dry eye.

Shapiro et al⁷ examined the precorneal tear film in healthy 440 young students including men and women brought up in the same environmental conditions and concluded that there was no appreciable effect on the schirmer's test and break up time of the tear film which is in accordance with the present study.

Ozdemir M et al⁸ studied age and gender related changes in Schirmer's test and concluded there was no statistically significant difference in the Schirmer's test results but found that Schirmer's test values were gradually decreased with advancing age⁸

The above studies clearly show the increase in the prevalence of Dry eye in females and with increase in age.

The Schirmer's test results in males was normal with more than 15 mm in age group of 21-30 years and the predominant results in age group of 71 years and above was 4-8 mm. (p value = 0.000)

The Schirmer's test results in females was normal with more than 15 mm in age group of 21-30 years and the predominant results in age group of 71 years and above was 4-8mm. (p value = 0.000)

The comparison of schirmer's test results among normal males and females was significantly decreased with a p value of 0.131. The values of decreased TBUT in males of age group 21-30 was 29.3% and 100% in 70 years and above.

The comparison of males in 21-30 years and 71 years and above was statistically significant with a p value of 0.000.

The values TBUT in females in age group 21-30 is 48% and 100% in 71 years and above.

The comparison of females with age group 21-30 and more than 71 years was statistically significant with a p value of 0.000.

CONCLUSIONS:

Dry eye is more common than symptomatic dry eye.

Schirmer's test is less sensitive than TBUT in detecting dry eye.

Dry eye is directly related to increase in age.

Dry eye is more common in females when compared to males.

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