Estimation of tear film break up time in normal peoples of Diwaniya,Iraq

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الخلاصة

الغرض من الدراسة: -الغرض من هذه الدراسة هو من اجل قياس وقت انكسار طبقه الدمع العينية وهو فحص لثبات طبقه الدمع عند الناس الطبيعيين.

طريقه العمل: -تم اختيار 286 شخص طبيعي اعمارهم بين 12 الى 78 سنه للمشاركة في هذا البحث و تم قياس وقت انكسار طبقه الدمع باستخدام ماده الفلورسين مع المحلول الملحي المتعادل و تحت درجه حراره الغرفة الطبيعية و تم اخذ ثلاث قياسات لكل شخص.

النتائج:- معدل وقت انكسار طبقه الدمع كان 15.3 ثانيه مع معامل انحراف 4,7 كما اثبتت الدراسة ان وقت انكسار طبقه الدمع يقل مع العمر و ليس هناك فارق ملحوظ بين الجنسين .

التوصيات: -ان وقت انكسار طبقه الدمع المستخلص من الدراسة هو مشابه لغيره في البحوث المجراه على الشعوب الاسيويه و هو اقل من حيث الوقت مقارنه مع الوقت في الشعوب الاوربيه ، يوصي الباحث بضروره قياس وقت انكسار طبقه الدمع لكل مريض من اجل معرفه ثبات طبقه الدمع لكل مريض.

ABSTRACT

Objective: to estimate tear film break- up time , a test of tear film stability in normal Iraqi population.

Material and method: 286 normal subjects (146 male and 140 female) age from 12 to 78 years were participated in this study, tear break -up time is estimated using impregnated fluorescein strip wetted with normal saline and the measurement is done in one room with stable temperature and door closed , three readings for each subject and the mean is taken .

Results: The mean TBUT in this study was 15.3 second with SD 4.7 (range from 6-28s), the study show TBUT to be decreased with age, The study show significant difference in result between male and female.

Conclusion : The tear break -up time (TBUT)values in this study are comparable to those reported for Asian population but much less than those for western population; there is significant difference between gender and the results tend to decrease with age.

Introduction

The tear film form a stable continuous layer covering the cornea and conjunctiva , the tear film has a three layered structure consisting of an outermost lipid layer, a middle aqueous layer and an innermost mucin layer on the corneal epithelium [1].Deficiency in any of the component of these layers may result in instability of tear film causing dry eye [2,3].The stability of tear film is maintained by the interaction of the tear film with the corneal epithelium and the eyelid .Blinking spread the tear film over the cornea and the conjunctive and rewets areas of dryness,when blinking is prevented the tear film eventually will break up. When fluorescein is added to the tear film , the break up will be seen as black spots or streaks on the cornea [4].

Tear film stability and production have been studied for several years [2-7.] Tear film break up time TBUT is the most commonly used clinical test for tear stability and its routinely used for the diagnosis of dry eye [8].

There are variable reports on TBUT measurement and several reasons have been given to account for these differences. Many studies have report ethnic differences [2,3, 9-16]. TUBT < 10 seconds is considered abnormal in Caucasians eyes but has been shown to be normal in Chinese eyes [3,19]. There are also reports on other factors like gender , age , climate [4,4,14-16], while recent studies indicate no climatic effect[9,12,17]. Gender consider with the age as important factor that associated with many diseases causing dry like keratoconjuctivitis sicca which is commonly seen in menopausal and pregnant

women , may be due to high hormones levels [18,19].

Tear film lipid , which is important factor in prevention of evaporation of tear has shown in higher levels in women than men [19] ,tear flow rate decrease in female after 35 years of age but not in males[20]. mucin levels show no difference between male and female [20].many studies in different countries have been done to estimate TBUT and its relation to age and gender and this study aim to estimate TBUT in normal Iraqi subjects living in Diwaniya city , middle of Iraq and compare results regarding age and gender.

Materials and Methods

The sample of the study consist of 286 normal subjects (146 male , 140 female) aged form 12 to 78 years old , all the sample subjects are asymptomatic ,attended the eye clinics in Diwaniya teaching hospital usually to correct refractive errors , has no other eye diseases with no history of contact lens use or any medications taken or any surgery.

Measurement of TBUT done in the same room with relatively constant temperature (around 24C with air-condition control) with the door closed , one examiner do all the measurements using slit lamp bimicroscope with fluorescein strip wetted with preservative- free saline , excess fluid is discarded and the strip is applied to the superior bulbar conjunctiva , the subject is asked to blink three times , measurement is done using cobalt blue filter with wide beam slit and 10 magnification power with low illumination the time between last blink and the first appearance of dark spot on the surface of the cornea is measured using stop-watch , this procedure is repeated for three times and the mean of the readings is taken for every subject to be considered as the TBUT for that subject .

Results

The mean TBUT in this study was 15.3 ± 4.7 second (range from 6-28s), there was a significant negative correlation between age of patients and TUBT (r= -0.447, P<0.001), i.e within the age range of the subjects as in (Figure 1) which show the distribution of TBUT in the 286 subjects of the study against the age :
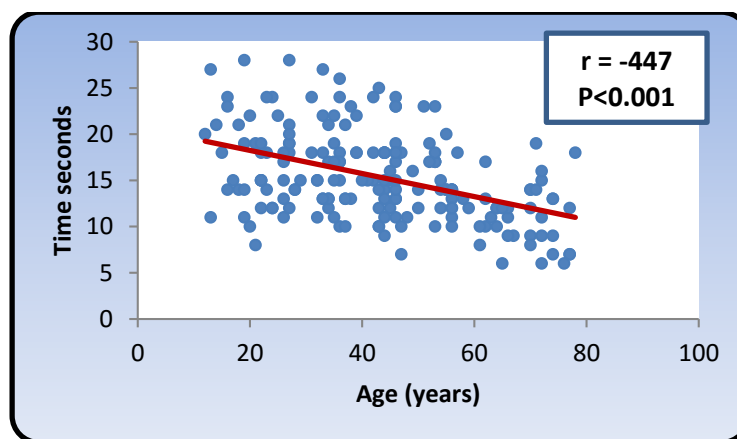

Figure 1 :- Pearson's correlation coefficient show negative correlation of TBUT with age of the subjects.

If we divide the total number of the subjects into 3 groups according to age we will notice a significant decrease in TBUT value in subjects above 55 years as in the " Table 1" and "Figure 2" :

Age intervals	Mean	SD
<35 years	17.18	4.83
35-<55 years	16.15	4.36
≥55 years	11.84	3.35
Total	15.33	4.78

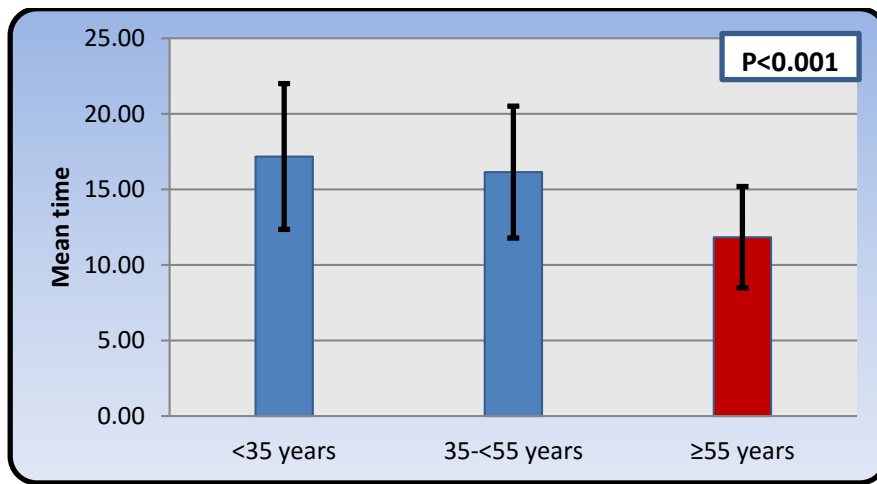Table 1 show significant decrease in Mean &SD in peoples above 55 years

Figure 2show significant decrease in Mean &SD in peoples above 55 years

The study show significant difference in result between male and female as in the "Table 2" and "Figure 3"

Gender	N	Mean time	SD
Male	146	16.24	4.72
Female	140	14.38	4.69
Total	286	15.33	4.78

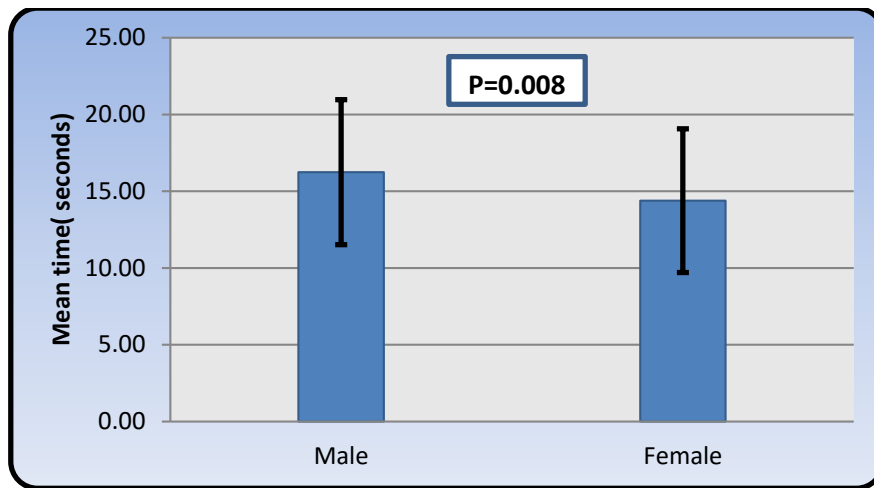Table 2 show significant difference in results between male and female.

Figure3 show significant difference in results between male and female.

Discussion

The study show the mean of the TBUT (15.3+ 4.7s) in this sample of the Iraqi population , this result is lower than that reported for western population[11,15,17]and comparable to that reported for Asian population[9,10], this might be due to racial and genetic factors , may be due to environmental factors too , also might have resulted from tear film composition which is different from person to person[21]. A greater sample size with similar age groups might yield more confirming results.

Results of the study show significant difference between male and female , TBUT was higher in male, this against the study done by Lemp and Hamil[2] which show a higher TBUT in female , Hormonal alterations in women reported to affect the functions of the meibomian glands and then affect the results of the TBUT.

TBUT shown to decrease with age , this agree with other studies [12,16].age seemed to be a determinant factor on TBUT results .some studies show no age effect on the result which might be due to narrow age limits for the subjects 4 who examined subjects between 18 to 25 years , while if we look at the results of the study we will see significant drop in the TBUT in the 3rd group (>55years). The results subjects below that age are comparable and relatively show no significant decline with age .

The result in this study are similar to that obtained by Brown [22], Patel and Farell[16] as the TBUT decline with age which is due to a combination of factors involving changes in tear flow,tearosmolarity, ocular surface,and the effectiveness of the eyelid in maintaining the tear film.

Ethnic differences have been reported to affect the TBUT result Caucasians have been reported to have a wider range and a higher average values than Indians and Chinese [9,11,15,17], this lower value for Indians have been attribute by Sukul et al [10], to tropical climatic changes , the cool climate of the western countries may have been responsible for the higher TBUT.

Conclusion

Thetear break- up time (TBUT)values in this study are comparable to those reported for Asian population but much less than those for western population; there is significant difference between gender and the results tend to decrease with age.

Recommendations

Because of this different reports in the literatures of the TBUT studies, the cut –off value should be revised for various ethnic groups , normal TBUT range should be established for specific age groups within ethnic groups. A cut –off point of 8 seconds include 89% of the study group which is

advised to be used as normal value for

TBUT in normal Iraqi subject.

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