The Etiology of Dry Eye Syndrome in a Group of Patients visited Ophthalmic Department of Azady Teaching Hospital in Kirkuk

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1- Introduction

Dry eye is a multifactorial, chronic inflammatory condition of the tears and ocular surface that causes ocular discomfort, and vision abnormalities [1]. Its under-recognized clinical disorder whose etiology and treatment challenge clinicians and researchers [2]. The condition has a significant detrimental effect on the quality of life such as computer use, reading and driving [3]. by chronic irritation or burning that, may cause an inflammatory damage to the cornea and conjunctiva [4]. Dry eye caused by either decrease in Aqueous tear results from deficient aqueous tear production, or increased evaporative. So, any condition that increases the evaporation rate of tears, such as meibomian gland dysfunction or extended reading time can lead to dry eye [5]. A hotter area of dry eye studies is the implying for visual function and its quality [6]. The decrease in the rate of blinking that occur during visual tasks as in case of (extended reading, watching TV, laptop and mobile use) can enhance dry eye and its signs and symptoms which as a result, interfere with the patient's visual function [7].

Aim of study

1)To clarify the etiology of dry eye syndrome.

2) Distribution of age and gender among study group.

3) Identify risk factors for dry eye.

2- Method

2.1 *Patients and materials*

2.1.1 ***location:*** The study was conducted at Azady Teaching Hospital in Kirkuk city.

2.1.*2* *Sampling:* 946 patients (504female ,442 male) aged above 40 years taken with permission and agreement to participate in this study.

2.2 *Design of the research:* A descriptive study undertaken on an outpatient base in the ophthalmology department of Azady Teaching Hospital from first of July 2020 to first September 2021.

2.3 *Ethical Approval*: By approval from Research Committee of the Iraqi Ministry of Health, with permission and agreement of participants in this study to examined clinically for dry eye symptoms.

2.4 *Inclusion criteria:*

1)sample included patients from 40 years age and above, with any ocular sign attending ophthalmology department.

2)Those newly or previously diagnosed as dry eye.

2.4 *Exclusion Criteria:*

1)Those below 40 years of age.

2)Those with active keratitis or conjunctivitis, foreign body, extensive ocular surface diseases

3)Patients with recent ocular surgery.

4)patients presenting second time for follow-up.

2.5 *Data Collection Tool*: In this study we choose a population from urban and rural regions with different complaints that may or may not include a dry eye component. Patients above 40 years were selected and administered a structured questionnaire designed for that purpose. Questions asked about name, age, gender, job, style of living (indoor or outdoor) chief ocular complaint like (burning sensation, itching sensation, grittiness, dry eye feeling, sticky eye, heaviness, and watering), duration of the disease, medical history (Diabetes mellitus, hypertension, allergic disease, asthma, Rheumatoid Arthritis) past surgical history, drug history (systemic and ocular), smoking, history of ocular disease, contact lens use, symptoms as itching, foreign body sensation, blurred vision, irritation, lack of tear and exaggeration of symptoms at extremities of the day. Clinical data of all patients were gathered through a study of medical records and a face-to-face interview with the patient. Dry eyes were recognized on the basis of discrete variables of symptoms like burning sensation, irritation, itching and

discomfort vision that relieves with blinking. The condition was confirmed with a slit lamp examination (using slit light) at 16x magnification for tear film abnormalities like the height

of tear meniscus, its regularity and debris, tear meniscus less than I mm regarded as thin tear), tear film break up time (TBUT) performed by applying a sterile normal saline on a fluorescein strip and applied to the inferior fornix. After a few blinks, the patient was told not to blink any more, and with a broad beam of the slit lamp by a blue filter the tear film was examined. The TBUT was calculated as the time between the last blink and the appearance of the first randomly distributed black discontinuity in the stained tear film. Patients with TBUT < 10 s were diagnosed as having dry eye, and Schirmer test done by using Schirmer paper on both eyes without anesthetic and amount of wetting measured after 5 minutes, less than 10 mm wetting of Schirmer paper regarded positive. Diagnosis confirmed when one or both of tests (BUT or Schirmer) revealed positive, In addition to dry eye symptoms and signs with slit lamp examination for Bulbar and limbal conjunctival hyperemia and superior limbic keratoconjunctivitis, pterygium, pinguecula, old trachoma and scars. Lid margins examined for blepharitis, MGD, telangiectasia, abnormalities ectropion, entropion). Cornea examined for presence of punctuates erosion, filament, and mucus plaque using florescence paper. Lacrimal gland examined for any swelling or old scar Structures of the anterior segment (lids, cornea, and conjunctiva) were assessed.

2.6 *statistical analysis:* In our study for Statistical analysis, we use SPSS version 20.0 significance was considered to be P value < 0.05. Data were presented as means ± SD Chi square test and t- student test was used to compare Patients.

3-Result

Out of 946 patients 168 (17.8%) diagnosed with dry eye syndrome, the mean age of study group was 55,5 years, mean age of dry eye group was 57,2 years, The prevalence of dry eye in study group was 17.8 % (168) and founded to be maximum in the elderly as most of dry eye group were in the sixties 42% table (1).

Age group	Frequency	percent
40-49	38	22%
50-59	44	26%

60-69	70	42%
70-79	16	10%
Total	168	

Table (1) Age distribution among the dry eye group

The study group composed of 504 females and 442 males; Dry eye syndrome funded to be more common in female 98 cases (19.4%) than in male 70 cases (15.8%) with p value 0.016. The majority of dry eye females in this study was at postmenopausal state 64 cases (65.3%) while 34 cases (34.7%) were premenopausal. (p value 0.039) and smoking founded to had no effect on the dry eye (p value 0.23). Regarding the lifestyle we didn't find any significant effect on dry eye syndrome among those working outdoor or indoor the p value was (0.153) as shown in table (2).

variable		frequency	Total	percent	P value
Sex	Male	70	442	15.8%	0.016
	Female	98	504	19.4%	0.016
Occupation	Indoor	112	624	18%	0.153
	Outdoor	56	322	17.4%	0.153
Hormonal	Premenopausal	34	98	34.7%	0.039
	Postmenopausal	64	98	65.3%	0.039
Smoking	Dry eye group	14	168	8.3%	0.23
	Study group	67	778	8.6%	0.23

Table (2) Sociodemographic distribution of dry eye

The main etiological factors in our study were either: ocular, systemic or drug Induced, as shown in table (3).

Ocular causes: main ocular causes were: eye lid diseases (blepharitis and MGD) 32 cases (20%), abnormal ocular surface (pterygium, and pinguecula) 20 cases (12%), old trachoma 8 cases (4.8%) ocular surgery 6 cases (3.6%) and Trauma 4 cases (2.4%).

Systemic causes: main systemic disease founded in our study were: rheumatoid arthritis 20 cases (12%), diabetes 18 cases (10.7%), thyroid disease 8 cases (4.8%) Sjogren disease 4 cases (2.4%) and pemphigus 2 case (1.2%).

Drug induced dry eye: Drugs that contribute to dry eye found to be mainly antihypertensive 26 cases (15.4%), antiglaucoma 14 cases (8.3%), antihistamine 4 (2.4%) and anticholinergic2 (1.2%).

Category	causes	Frequency	Percent
Ocular causes	Diseases of the eyelid	32	19%
	Ocular surface abnormalities	20	12%
	Old trachoma	8	4.8%
	Ocular surgery	6	3.6%
	Trauma	4	2.4%
Systemic disease	Rheumatoid Arthritis	20	12%
	Diabetic	18	10.7%
	Thyroid disease	8	4.8%
	Sjogren	4	2.4%
	Pemphigus	2	1.2%
Drug induced	Antihypertensive	26	15.5
	Antiglaucoma	14	8.3%
	Antihistamine	4	2.4%
	Anticholinergic	2	1.2%
Total		168	100%

Table (3) Dry eye causes

Most frequent symptoms: symptoms most frequently seen in dry eye case are listed in table (4).

Symptom	Frequency	percent
Irritation	148	88%
Itching	142	84.5%
foreign body sensation	110	65.4%
Blurring of vision	92	54.7%
Burning sensation	64	38%
Red eye	60	35.7%

Table (4) Most frequent symptoms of dry eye patients

Less frequent symptoms:

These symptoms less frequently present among dry eye cases as shown in Table (5).

Symptom	Frequency	%
Crust on eye on waking	54	32%
Pain on blinking	42	25%
Photophobia	34	20.2%
Lack of emotional tear	30	17.9%

Table (5) Less frequent symptoms of Dry eye patients

Most common sigs: signs are most frequently presents in dry eye cases shown in table (6).

Sign	Frequency	percent
Thin tear meniscus	130	77.4%
Irregular tear film	121	72%
Loss of concavity of tear film	116	69%
Debris in tear film	86	51.2%
Foamy tear	80	47.6%

Table (6) Most common signs of dry eye patients

Less common signs: Signs less frequently seen in dry eye patients was PEE 25 cases (30%) corneal filament 9 cases (10%) and mucus plaque 5 cases (6%).

Sign	Frequency	percent
PEE	50	29.8%
Corneal filament	18	10.7%
Mucus plaque	10	6%

Chart (7) Less common signs of dry eye patients

Dry eye tests:

Among dry eye patients 138 cases shows Schirmer test less than 10 mm After 5 minutes, and 86 cases of them had TBUT less than 10 seconds as shown in Fig (1).

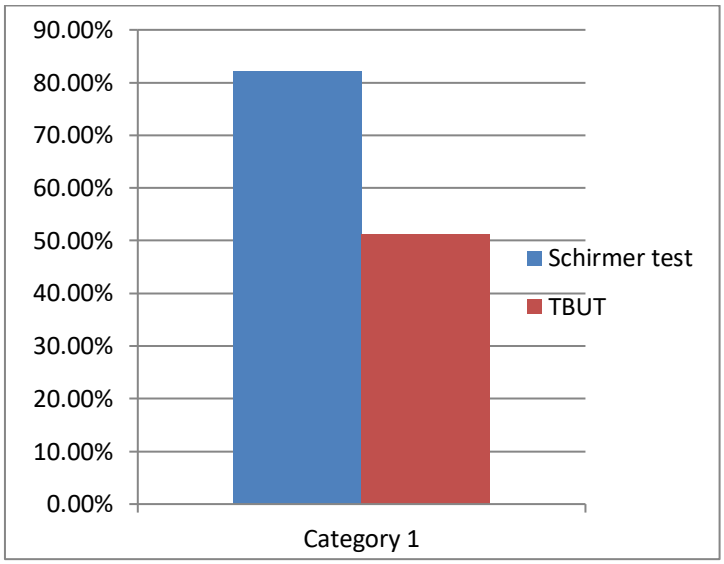

Figure (1) Sensitivity of dry eye tests among dry eye patients

4- Discussion

Among 946 patients participate in our study, 168 patients (17.8%) had pictures of dry eye disease. This result is compatible with the results of study by Johnny L Gayton showed that prevalence of dry eye is ranging from 7% in the United States to 33% in Taiwan and Japan [8]. In a meta-analysis Global mapping of prevalence was undertaken, the prevalence of dry eye disease ranged from 5 to 50%.[1].

The prevalence of dry eye disease in Europe is consistent with global estimates: 7–22% [9]. Dry eye disease prevalence ranging from <0.1% to as high as 33%. (This wide variation among studies is the result of different dry eve syndrome definitions and study populations [10]. Mean age of study group was 55.5±8.4 years SD, mean age of dry eye group was 57.2 years, there was significant differences between study group age and dry eye group age. (p=0.043), most of confirmed dry eye cases were in the sixties (42%). This result is compatible with the results of many population-based [11]. Many studies supported the view of an age association of dry eye by the

finding of significantly drier eye in the group aged older than 40 years [12], [3].

The study group composed of 504 females and 442 males. Dry eye syndrome founded to be more common in females 98 cases (19.4%) than in males 70 cases (15.8) p=0,016). This is compatible with other studies, as in the study done by Farrand KF et al., [14]. Women were almost twice as likely to report severe symptoms dry eye as men. The majority of dry eye women 53 cases in this study found to be post-menopausal 34 cases (64%) and 19 cases (36%) pre-menopausal (p=0.03). The high prevalence of dry eye in women often related to

postmenopausal changes in hormones Debra A. Schaumberg et al... [15], Piera Versura et al ... [16]. Regarding the lifestyle we didn't find any significant effect on dry eye syndrome among those working outdoor or indoor in compare to other studies a considerable decrease in subjective symptoms of dry eye disease among office workers seen, with a Lifestyle intervention. [17]. and this may be due to that most of dry ye cases in our study were females with indoor living. Smoking founded to had no effect on the dry eye in our study in one meta-analysis also there was no statistically significant relationship between smoking and dry eye. [18]. Most frequent symptoms present among dry eye cases in our study found to be irritation (88%), itching (84%), foreign body sensation (659%), blurring of vision (54%), burning sensation (38%). and red eye (35%), crust on eye on a waking (32%), pain on blinking (25%), photophobia (20%), and lack of emotional tear (18%). In comparison with other studies by - Craig JP. and coworkers found Specific symptoms like burning, stinging, feeling of discomfort in the eyes, foreign body sensation, tearing, redness, blurred vision, and tired eyes. [19]. The main etiological factors in our study were either ocular, systemic or drug induced. Main ocular causes were eye lid diseases (blepharitis, MGD) (20%) and abnormal ocular surface (pterygium, and pinguecula) (13%), old trachoma (6%) ocular surgery (4%), trauma (3%). This is similar to study by. McCulley and Shine JP. [20], and Junhua Li. [21]. The major systemic diseases founded in our research were rheumatoid arthritis (13%), diabetes mellites (11%), thyroid disease (6%) Sjogren syndrome (3%) and pemphigus (1.5%) this also seen in studies by Carlos Estrada-Reyes [22], and Moss SE et al., [23]. Drugs that contributed to the dry eye syndrome founded to be mostly antihypertensive (14%). antiglaucoma (9%), antihistamine (3%) and anticholinergic (1.5%).in other studies shows that wide range of drug categories can cause dry eye [24], [25]. Signs most frequently presents in dry eye cases in our study are thin tear meniscus (77%), irregular tear film (7 1%), loss of concavity of tear film (68%), debris in tear film (5 19%) and foamy tear (47%). Signs less frequently seen in dry eye patients found to be. PEE (30%), corneal filament (10%) and mucus plaque (6%). In other study the most frequent eyelid abnormalities were hyperemia (72.3%), bridge vessels across

the margin (66.2%), and notching (60.3%). The most frequent conjunctival abnormalities were nasal staining (46.2%), conjunctivochalasis (43%), and hyperemia (40.3%). The most frequent corneal abnormality was inferior staining. [26]. Dry eye is a multifactorial disease with a different clinical presentation, has multiple symptoms and signs that often do not correlate with one another [27]. Among dry eye patients 68 cases (80%) show Schirmer test less than 10mm after 5 minutes and 43 cases (51%) of them had BUT less than 10 seconds,

and this indicate that most of dry eye cases were due to tear deficient, same are seen in a study by Korb, Donald R. The second most frequently chosen test was break-up time (TBUT) (19%), The Schirmer test was most frequently included as one of the four choices (62%),[28].

5-Conclusions

Patients above 40 years are at high risk of dry eye discase and this should kept in mind when examining patients in ophthalmic department, females also more prone to dry eye specially those at post-menopausal state and this should consider when examining female at out patients' clinics, Dry eye is a frequent disease and correct diagnosis is the main line in treatment and, so in order to not overlooked we need to keep in mind those at higher risk like patients with ocular diseases as pterygium, pinguecula, trauma, previous ocular surgery and patients with old trachoma. systemic disease as rheumatoid arthritis, diabetes, thyroid and those with chronic drug use as antiglaucoma, antihypertensive, antihistamine and anticholinergics.

6-Recommendations

We recommend that further studies in the future to be done to get more information about prevalence, incidence and risk factors of dry eye in us community.

Abbreviations

TBUT: Tear break up time
MGD: Meibomian gland dysfunction
PEE: Punctate epithelial erosion
SPSS:
SD: Standard deviation

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