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Relationship Between Severity of RA and Dry Eye Syndrome

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A B S T R A C T

Background: Rheumatoid arthritis (RA) is a chronic inflammatory disease with extra- articular involvement. Eyes in particular are one of the most common sites of involvement in rheumatoid arthritis. On the other hand, dry eye syndrome is the most common conflict in terms of management. Particular studies suggested dry eye has been associated with greater rheumatoid arthritis severity, but its association with disease severity is not known.
Objectives: To investigate relationship between the severity of active RA and dry eye.
Patients and Methods: In this cross- sectional study, 60 patients with RA were enrolled. Severity of RA was calculated using the formula of DAS28-ESR. Simultaneously, in addition to clinical findings of rheumatoid arthritis, appropriated eye examinations were performed. Relationships between the severities of RA with a positive rate of dry eye syndrome were assessed.
Results: The mean severity of RA that had definite dry eye syndrome according to DAS28-ESR was 4.53 mm. However in the group without dry eye syndrome the calculation was 3.93. Totally, there was no significant correlation between the severity of RA and dry eye syndrome (P = 0.39).
Conclusions: Our investigation showed that dry eye syndrome is not associated with severity of rheumatoid arthritis.

Keywords: Arthritis, Rheumatoid; Dry Eye Syndromes; Severity of Illness Index

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Implication for health policy/practice/research/medical education:
The applicability of these results is important for Rheumatologists in treatment and follows up of RA. Eyes should be always examined for dryness regardless of RA activity. And it also would help to improve the health policy.

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1. Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease with unknown origin that is shown with symmetric erosive arthritis (1). In this disease, the extra-articular manifestation is high which increases morbidity and mortality (2, 3). The total number and severity of extra articular symptoms varied with the duration and severity of the disease (4, 5). RA activity will determine the type and the amount of drugs prescription (2, 6, 7). Generally, the main goal of RA treatment would be reduction of disease activity (5). Involvement of surface layer of the eye is common in RA (8). Moreover, RA has a tendency to develop scleritis, episcleritis, corneal ulcers and dry eye syndrome. The prevalence of ocular complication is almost 11-31% (8). Generally, the most common form of ocular involvement would be dry eye (9, 10). Some items which are predictable in disease activity are extra- articular symptoms including ocular symptoms with the variable consequences.

2. Objectives

While diagnosis of dry eye syndrome is challenging, our aim was to evaluate symptoms of dry eye syndrome and to investigate the correlation between dry eye and severity of RA.

3. Patients and Methods

3.1. Methodology

In this cross sectional study 60 patients who referred to rheumatology clinics in Zahedan according to 1978 classification criteria were enrolled. Zahedan is the capital of Sistan and Baluchestan province located in southeast of Iran with the hot and dry weather. All patients were examined by an expert rheumatologist for definite diagnosis based on American College of Rheumatology classification criteria (11). None of the patients had any conditions associated with sicca syndrome defined as dry eyes and dry mouth such as allergy, sjogren disease, collagen vascular disease, diabetes mellitus, facial nerve paralysis, HIV infection, drug abuse, and medications consumption. The exclusion criteria were: drivers, long-lasting workers with computer, cigarette smoking, corneal surface diseases, ocular pamphigoid, Stevens – Johnson syndrome, pregnant women, contact lenses wearers during past six months, former history of eye surgery, and individuals with meibomian gland dysfunction. For each patient, a baseline evaluation for severity of RA based on DAS28-ESR formula had been calculated and then all included patients were referred to an ophthalmologist in order to finding evidence of dry eye syndrome. Four tests were conducted for study of dry eye syndrome, including; Schirmer, fluorescein staining, meniscus tear and Tear Break- up Time (TBUT) (1).

Patients who had two or more positive tests had been considered as definite dry eye (6). Individuals who had only a one positive test diagnosed as probable cases. Informed consent to all participants was obtained and study was approved by the institutional review board of the Zahedan University of Medical Sciences, according to the Declaration of Helsinki. Data were analyzed using Kendal correlation between the severity of RA and dry eye syndrome. $P < 0.05$ was considered as significant value.

4. Results

The mean age ± SD of patients was 40 ± 13 years. 6 patients (10%) and 54 (90%) were men and women, respectively. Most patients were diagnosed during past six months. The mean severity of RA in patients with definite dry eye syndrome based on DAS28-ESR formula was 4.50 and in the group of patients with probable dry eye syndrome was 4.32 whereas in the group negative dry eye syndrome was 3.93 (*Table 1*). Although there was differences in severity of RA among three groups, but correlation between the severity of RA and dry eye syndrome was not significant ($P = 0.39$, $r = 0.09$).

Table 1. The Mean Severity of RA Based on Dry Eye Syndrome Type

Group Mean Severity of RA (DAS28-ESR)	
Definite Dry Eye Syndrome	4.5
Probable Dry Eye Syndrome	4.32
Negative Dry Eye Syndrome 3	3.93

Erythrocyte sedimentation rate (ESR) measured among groups of patients; although this difference was not statistically significant ($P = 0.2$) (*Table 2*).

Table 2. ESR Mean Based on Dry Eye Syndrome Type

Group	ESR mm/h1(western)
Definite Dry Eye Syndrome	34
Probable Dry Eye Syndrome	26
Without Dry Eye Syndrome	20

Abbreviation: ESR: Erythrocyte Sedimentation Rate

5. Discussion

Our study revealed there was no relationship between mean severity of RA and dry eye syndrome. The mean severity of RA in patients with dry eye syndrome based on DAS28-ESR formula in our study groups were 4.50, 4.32 and 3.93, in patients with definite dry eye syndrome, probable dry eye syndrome and negative dry eye syndrome, respectively. In different studies, dissimilar results were obtained. Gilbo et al. in 2001 concluded that dry eye syndrome in RA patients reflect more activity of disease and there was relationship be-

tween dry eye, ESR, and number of painful joints (12). In a prospective case-control study in 2005, Fujita and colleague (6) from Japan evaluated the incidence of dry eye in RA cases with or without Sjögren syndrome (SS) as well as investigated the correlation between dry eye and RA activity. In 72 RA cases, the severity of dry eye was assessed by the Schirmer test, TBUT, rose bengal, and fluorescein staining. The RA activity was evaluated by the Lansbury index (LI). They concluded dry eye is common in RA patients; including those without SS, there was a correlation between LI and Schirmer test in RA patients with SS however no correlation when the entire group was analyzed had been noted.

Eyes should be always examined for dryness regardless of RA activity because the existence of dry eye is independent to severity of RA. Moreover, systemic deterioration and increased severity of RA and dry eye syndrome is not correlate with deterioration and RA severity necessarily, therefore it should be considered in patients with mild to severe RA (9). According to study that was conducted in 2003, RA severity have not significantly related with secondary Sjogren's syndrome (4). Wolfe and colleagues in 2008 (13) revealed that the symptoms of sicca is more common in RA patients who had higher Disease Activity Score, pain and disability. No study expressed exact reason of these differences. One of the possible reasons is using of non-standard regimes (such as steroids or nonsteroidal anti- inflammatory medications) that can affect the severity of the disease, as noted in our present study that is one of our study shortcoming. Although, DAS28-ESR formula is quantitatively but the part of the formula is depending on individual's tolerance to pain which is more toward too subjective criteria. This accomplishment reduces the accuracy of the formula in determining severity of RA.

Limitations of our study were the lack of tear osmularity and Lyzamin green test for eye dryness evaluation, and as previously noted, consideration of patient's medication regimens that can affect the severity of the disease. According to our study no relationship between the severity of RA and dry eye syndrome or ESR mean has been found. We propose people with RA should be evaluated early in the diagnosis and serially in terms of dry eye in spite of the severity of rheumatoid arthritis. If the patient complained of dry eyes or mouth then should be treated in dependently from the underlying disease.

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Authors' Contribution

Study design: Z.Z., MP, Data collection Z.Z, MP, HZ, MS, MA, Data analysis: AA, Literature review: Z.Z, MP, Manuscript preparation: Z.Z, MP, A.B, S.S.

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