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Original Research Article

To Study the Ocular Manifestations of Rheumatoid Arthritis

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Abstract:

Methods: 100 rheumatoid arthritis patients who attended the ophthalmology outpatient department underwent a detailed ocular examination using slit lamp biomicroscopy and ophthalmoscopy. The tear function of all the patients was assessed using Schirmer's test, tear film break-up time and ocular surface staining.

Results: 38 out of the 100 patients studied had ocular manifestations typical of rheumatoid arthritis. Dry eye was the most common manifestation (81.6%). Of the patients, 70% was females (70 patients). The mean duration of rheumatoid arthritis in patients with ocular manifestations was 5.4±2.7 years and without ocular manifestations was 2.1±1.6years. 7.9 percent of the patients had episcleritis (3 patients). Scleritis was present in 2.7% of the patients (onepatients). Peripheral ulcerative keratitis was present in one patient (2.7%). Anterior uveitis was present in two patients (5.3%). Eighty-five percent (85 patients) had bilateral manifestations 15% (15 patients) had unilateral manifestations.

Conclusion: Ocular manifestations are a significant part of the extra-articular manifestation of rheumatoid arthritis. Dry eye was the most common ocular manifestation.

Keywords: rheumatoid arthritis, ocular manifestations, dry eye, scleritis, peripheral ulcerative keratitis

Introduction

Rheumatoid arthritis is mainly characterized by inflammation of the lining, or synovium, of the joints. It can lead to long– term joint damage, resulting in chronic pain, loss of function and disability. RA has a worldwide prevalence of 1%.[1,2,3] The average age of onset is in the fourth to fifth decade of life,[4] with a three times greater predilection in women than in men.[5] It can have devastating systemic and ocular effects. The diagnosis of the disease is made on the basis of clinical criteria (ACR). 15-45% of patients with RA develop ocular manifestations. [2,3].

Keratoconjunctivitis Sicca (Sjogren's syndrome) is the most common ocular association of RA.[7,8,9]

It is clinically evident in 20-50% of patients with RA, particularly in women (90%). It may be an early or presenting manifestation of RA. KCS appears in RA as a result of decreased secretion of tears from the main and accessory lacrimal glands.

Rheumatoid arthritis (RA) is a chronic progressive, antibody-mediated autoimmune disease that primarily affects small joints. It also involves other organs and ophthalmic involvement is often significant, causing varying degrees of ocular morbidity. Ocular manifestations of RA include dry eye, episcleritis, scleritis and peripheral ulcerative keratitis (PUK).[1]

Material and Methods

It's a prospective study conducted in ophthalmology department of tertiary care hospital.

The study group consisted of 100 patients who presented for the first time to the outpatient clinic of the department of ophthalmology. The study was approved by the institute's ethics committee.

Inclusion criteria

All patients with RA undergoing routine ophthalmologic screening.

Exclusion criteria

- Presence of other autoimmune systemic disorders like systemic lupus erythematosus, graft versus host disease, and any immunosuppressive disorders.
- History of previous laser, previous ocular surgeries (except for uncomplicated cataract surgery) or ocular trauma.
- Insufficient media clarity
- Diabetes mellitus or decompensated heart failure

- Age-related macular degeneration, myopic atrophy, optic neuropathy, or amblyopia
- Glaucoma patients.
- Drug induced ocular manifestations which includes hydroxychloroquine-induced maculopathy and other effects induced by chronic immunosuppression.
- Age less than 18 years.

Parameters Studied in the Patient

The age, sex, and demographic data were initially collected from the patient. A detailed anterior segment examination using slit lamp was done to detect episcleritis, scleritis, and corneal changes. Dry eye examination was done using Schirmer's test, tear film break-up time, and ocular staining score. Fundus examination was done to detect any posterior segment manifestations.

Procedure

Patients were subjected to a thorough clinical examination to confirm the diagnosis of arthritis. Erythrocyte sedimentation rate, auto-antibodies specific to RA, and X-rays were done in all patients.

History of the ocular symptoms was obtained, and ocular examination was done in every patient with torch light and slit lamp biomicroscopy. Schirmer's test was done using Whatman filter paper and tear film break-up time was done using fluorescein stain in all patients to assess lacrimal function. Ocular surface involvement was assessed by fluorescein and Rose Bengal staining. Criteria for Sjögren's syndrome which includes the presence of a connective tissue disorder, duration of symptoms >3 months, tear film break-up time <10 seconds, Schirmer's test (without anesthesia) ≤5 mm/5 minutes, Van Bijsterveld score ≥4,4 the diagnosis of scleritis, episcleritis and PUK is mainly clinical. Scleritis is painful chronic inflammation of sclera which may be associated with vision loss. Episcleritis is a benign, self-limiting condition of the outer coat covering the sclera. PUK is a form of ocular inflammation that involves the outer portions of the cornea associated with progressive thinning. Dilated retinal examination was done using direct and indirect ophthalmoscopy to detect any posterior segment changes.

Observations

Age distribution

One-hundred patients were studied, of these (38%) had ocular manifestations of RA. Most of the patients fell between 30–50 years and the average age (mean ± standard deviation) of the patients was 43.85 years ±21.54.

Sex distribution

Of the total 100 patients studied, 77 (77%) were females and 23 (23%) were males (table 1)

Table 1: Sex distribution among studied population

Sex	Number of patients	Percentage
Male	23	23
Female	77	77

Duration of Disease and Incidence of Ocular Manifestations

The mean (mean ± standard deviation) duration of RA in patients with ocular manifestations was 5.4±2.7 years and without ocular manifestations was 2.1±1.6 years. The mean duration of RA among the patients with vision threatening complications like sclerosing keratitis and PUK was 10.5±3.1 years.

Ocular manifestations of RA

Among the 100 patients included in the study 38 (38%) had ocular manifestations typical of RA (Table 2). Thirty percent (30 patients) of the patients were on immunosuppressive therapy for their systemic condition. Oral steroid was the main agent used. Around 5% (5 patients) of the patients were on other immunosuppressive agents like hydroxychloroquine.

Table 2: Percentage distribution of ocular manifestations of rheumatoid arthritis among the total study population

Ocular manifestations	Number of patients(percentage)
Dry eye	81.6
Episcleritis	7.9
Scleritis	2.7
Peripheral ulcerative keratitis	2.7
Anterior uveitis	5.3

Laterality

Eighty-five percent (85 patients) of the manifestations was bilateral and only 15% (15 patients) was unilateral which mostly included scleritis, episcleritis, and PUK.

Table 3: Laterality among studied population

Laterality	Number of patients (percentage)
Unilateral	85
Bilateral	15

Patients with more than One Manifestation

Eighty percent (patients) of the patients with ocular involvement had only one manifestation. The remaining 20% (patients) had more than one manifestation which mainly included one of the vision threatening manifestations with associated dry eye or cataract.

Visual acuity in patients with ocular manifestations of RA

Eighty-six percent (86 patients) of the patients had normal visual acuity. Fourteen percent (14 patients) of the patients had decreased visual acuity due to manifestations like PUK, sclerosing keratitis, and scleritis and cataract.

Discussion

A total of 100 rheumatoid arthritis patients attending the clinic were studied. There were 77 (77%) females and 23(23%) males. Female: male ratio was. Similar female predominance was noted in other studies also like Chandreskharan et al. 15 (4:1) and Narayanan et al.16 (4:1). In this study age group of the study population ranges between 20-80 years with maximum number of patients in the age group of 38-50 years (9%). Mean age group in a study by Wanchu et al. was 41 years and mean age group in the study by Waters et al. was 45 years which showed concordance with the present study. The mean age in the present study was 42.48 years. In this study population, duration of disease (RA) ranged between few months to 25 years. Mean duration of illness was 5.2 years 64.2% of patients had disease duration in the range of 0-5 years. Wanchu et al. had studied patients with disease duration of 5.3+4.1 years. In a study by Kalke et al. the mean duration was 5 years. In this study population, ocular manifestations were found in (38.8%) patients in the age group of 46-50 years (17.9%). Ocular manifestations detected were keratoconjunctivitis sicca, episcleritis, diffuse anterior scleritis, and peripheral ulcerative keratitis.

Keratoconjunctivitis sicca was the commonest manifestation found, detected in (84.2%) patients. In a study by Shaw et al. incidence of severe dry eye was 5.55%. While 37.03 had borderline tear deficiency. A few of them had corneal epithelial lesions. All diagnosed patients were put on lubricant eye drops and were followed up. Reddy et al. [19] has found 29% of KCS in their study conducted at Hyderabad in

India, Gilboe et al.20 has found an incidence of 21%, while the study by byBhadoria et al.[21] showed an incidence of 17.7% and the incidence of KCS in the study by Mastuo et al. was22 17.10 %. Most of these studies show concordance with our study and in all of them KCS was the commonest ocular manifestation. In the present study episcleritis was noted in three patients (7.8%). Shaw C et al. reported an incidence of 3.7% episcleritis in their study. Bharodia et al. had an incidence of 0.93% in their study.

Diffuse anterior scleritis was seen in 1 patient (2.6%). In a study by Matsuo et al. the incidence of scleritis was 0.9% Marginal corneal furrowing was seen in 1 patient (2.6%). Reddy et al.[20] in this study has reported a case of marginal corneal furrowing.

Conclusion

The present study shows that there is a high incidence of ocular involvement in rheumatoid arthritis. Therefore, it is essential to include ophthalmic evaluation as a routine for rheumatoid arthritis patients to facilitate timely diagnosis so that appropriate management strategies can be employed to

prevent ocular morbidity as all these patients may not be symptomatic. The most common ocular manifestation detected was keratoconjunctivitis sicca, followed by episcleritis, anterior uveitis, diffuse anterior scleritis and marginal corneal furrowing

Ocular manifestations were found in 38 of the 100 patients studied which is 30% of the study population. Reddy et al in their study also found the incidence of ocular manifestations in RA to be 39% in a population of 100 patients.[5] This study indicates that ocular involvement is fairly common and the need for close follow-up. The rheumatologists should get an ocular examination done for all patients at diagnosis and then at periodic intervals for early detection of any ocular involvement. Punjabi et al reported that 27.3% of RA patients had dry eye in an Indian population.[6] Bettero et al reported secondary Sjögren's syndrome in 12.1% of the population with RA.[7] In the present study the prevalence of dry eye was 84.2% and was the most

common manifestation of RA. These results were similar to the previous studies mentioned above. The diagnosis of secondary Sjögren's was made based on the American-European Consensus Criteria for Sjögren's syndrome which was based on the duration of symptoms, Schirmer's test, and positive vital dye staining of the eye surface. Tear film osmolarity also correlates with dry eye activity. Tong et al found in a recent study that tear film osmolarity correlated with the dry eye severity score.[8] All this suggests that more research is needed on the markers of ocular surface in RA. Tong et al studied the immune factors that lead to dry eye and correlated them with systemic disease which could lead to potential treatment targets in the future showing the importance of conducting further studies on the ocular surface in RA patients.[8]Villani et al studied the effect of immunosuppression on the ocular surface via confocal microscopy and cytokines level and found that immunosuppression modified the ocular surface pathology in RA patients with secondary Sjögren's syndrome.[9]Villani et al studied the corneal involvement in RA by confocal microscopy and found the corneal surface activity was more in patients with secondary Sjögren's.[10] The ocular manifestations were more common with prolonged duration of the disease. The severity was also worse with longer duration of the disease. McGavin et al studied 4,210 patients with RA and established the incidence of episcleritis as 0.I7%.[11]Bhadoria et al reported episcleritis in 0.93% of the patients of the study population.[12] In the present study we found episcleritis in 7.8 % of the RA patients which is slightly higher than the above mentioned studies. Half of the patients with episcleritis had associated dry eye. In our study the vision-threatening complications were scleritis, sclerosing keratitis, and PUK which affected 14% of the study population. All the patients with vision threatening complications were positive for anti-CCP antibodies. McGavin et al reported the incidence of scleritis as 0.67% in RA patients.[11] In the present study scleritis was found in 2.6 % (1patient) of the study population which was comparable to the previous studies. Squirrell et al reviewed the clinical and serological characteristics of the arthritis at the time of presentation of PUK. All patients had a long history of high-titer seropositive, nodular, erosive RA which on presentation of PUK had been quiescent or well controlled for many years.[13] In our study the mean duration of RA among the patients with vision threatening complications like sclerosing keratitis and PUK was 10.5 years which was comparable to the abovementioned studies in which the vision threatening complications were associated with longer duration of the disease. Bettero et al reported ulcerative keratitis in 2% of the study population.[7] In our study both sclerosing keratitis and PUK were found in 2.6 % of the study population. All the patients had a long history of RA. Patient with sclerosing keratitis had unilateral involvement and only mild impairment of vision.

Conclusion

Ocular manifestations are a significant part of the extra-articular manifestation of RA. Dry eye was the most common ocular manifestation. There was a significant association between the duration of the disease and ocular manifestations. The longer the duration, more common and severe are the ocular manifestations.

Disclosure

The authors have no conflicts of interest to disclose.

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