ORIGINAL RESEARCH PAPER

Ophthalmology

KEY WORDS: Connective Tissue Disorders; Ocular Manifestations; Dry Eye Disease; Scleritis; Episcleritis; Uveitis; Rheumatoid Arthritis; Autoimmune Diseases; Anterior Segment Involvement; Posterior Segment Involvement

WHEN CONNECTIVE TISSUE DISORDERS LOOK YOU IN THE EYE

Dr Jayashree S Shah — Professor And Hod of Department of Ophthalmology, Sri Siddharatha Medical Colledge, Sri Siddharatha Academy of Higher Education, Tumkur, Karnataka, India

Dr Sourav B — Post Graduate, Department of Ophthalmology, Sri Siddharatha Medical Colledge, Sri Siddharatha Academy of Higher Education, Tumkur, Karnataka, India

Dr Niveditha R K — Associate Professor, Department of Ophthalmology Sri Siddharatha Medical Colledge, Sri Siddharatha Academy of Higher Education, Tumkur, Karnataka, India

Dr Lokesh H M — Professor, Department of Ophthalmology, Sri Siddharatha Medical Colledge, Sri Siddharatha Academy of Higher Education, Tumkur, Karnataka, India

ABSTRACT

Background and Objective: Connective tissue disorders (CTDs) constitute a group of chronic inflammatory diseases with multisystem involvement and a broad range of clinical presentations, including ocular involvement. The present study was conducted to evaluate the various types of ophthalmic manifestations associated with connective tissue disorders **Methods:** A descriptive cross-sectional study was conducted on 66 patients diagnosed with various connective tissue disorders at a tertiary care hospital between August 2025 and January 2026. All participants underwent a detailed and standardized ophthalmic examination. **Results:** Among the 66 patients, 20 (30%) were male and 46 (70%) were female. The highest proportion of cases was observed in the 41–50-year age group (28 patients; 42%). Rheumatoid arthritis was the most frequently encountered connective tissue disorder, accounting for 35 cases (60%). Both anterior and posterior segment involvement were noted, with dry eye disease being the most common ocular manifestation, observed in 33 patients. **Conclusion:** Connective tissue disorders encompass a broad spectrum of diseases with diverse ocular manifestations. Routine ophthalmic screening in patients with connective tissue disorders is essential for early identification and timely management, thereby improving visual outcomes and overall prognosis.

INTRODUCTION

Connective tissue disorders (CTD) are a group of chronic inflammatory disease that affects various systems of the body and therefore presents as a wide spectrum of clinical manifestations[1].These include a diverse set of diseases such as Sarcoidosis, rheumatoid arthritis, and Behcet's disease, along with more common entities like Sjogren's syndrome, dermatomyositis, scleroderma, and lupus erythematosus.[5]It is multifactorial involving immunological, environmental and genetic factors.[1]Ocular involvement include the ocular adnexa (lids, lashes, and orbit), tear film, sclera, cornea, the uveal tract, lens, vitreous cavity or the retina. [5]The commonality among these diseases lies in their underlying pathophysiology, which often involves immune-mediated inflammation and tissue damage.[6]

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted at the Department of Ophthalmology, Sri Siddhartha Medical College and Hospital, Tumakuru, Karnataka. The study was carried out over a period of three months. The study population comprised patients of both genders aged between 20 and 70 years who were diagnosed with various connective tissue disorders and attended the ophthalmology outpatient department during the study period. A minimum sample size of 66 patients was included in the study. Participants were selected using a purposive sampling method. Relevant demographic and clinical data were collected and analysed to assess the ocular manifestations associated with connective tissue disorders.

Inclusion Criteria:

- Both genders of age group between 20 to 70 years.
- All diagnosed cases of connective tissue disorder.

Exclusion Criteria:

- History of ocular trauma.
- Patients presenting with episcleritis, scleritis, uveitis due to causes other than connective tissue disorder.

After approval from the Institutional Ethics Committee and in accordance with the Declaration of Helsinki, this study was conducted following written informed consent. Data were collected using a structured proforma. Eligible participants underwent comprehensive ophthalmic evaluation including best-corrected visual acuity assessment, intraocular pressure measurement by Goldmann applanation tonometry, slit-lamp biomicroscope, Tear film evaluation like Schirmers test and Tear film break test, dilated fundus examination.

RESULTS

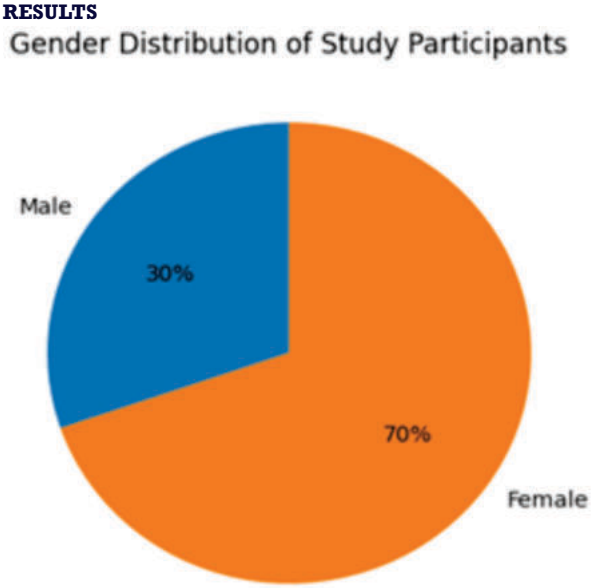

Figure 1: Gender Distribution of Study Participants

Of the 66 participants, 46 (70%) were females and 20 (30%) were males.

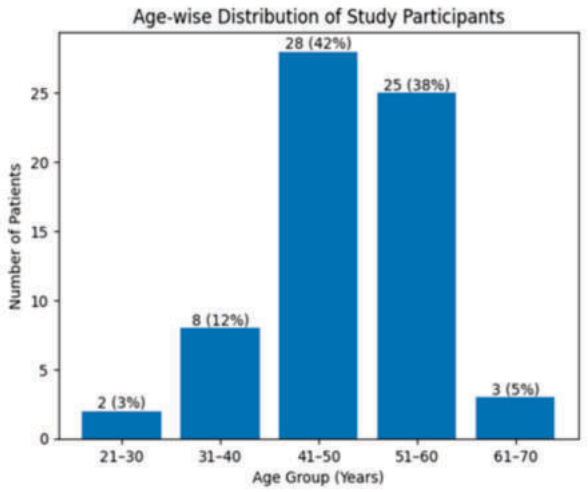

Figure 2: Age-wise Distribution of Study Participants Showing Number and Percentage in Each Age Group.

The majority of participants belonged to the 41–50 years age group (42%), followed by the 51–60 years group (38%). Fewer patients were observed in the younger (21–30 years) and older (61–70 years) age groups.

Table 1 : Distribution of Cases in Study Population

CONNECTIVE TISSUE DISORDERS	NO. OF CASES	NO. OF CASES WITH OCULAR MANIFESTATION	PERCENTAGE OF CASES HAVING OCULAR MANIFESTATION
RHEUMATOID ARTHRITIS	35	30	60%
SYSTEMIC LUPUS ERTHEMATOSUS	10	6	12%
SYSTEMIC SCLEROSIS	1	0	-
POLYMOSITIS AND DERMATO-MYOSITIS	1	0	-
SYSTEMIC VASCULITIDES	3	2	4%
MARFAN'S SYNDROME	5	4	8%
ANKYLOSING SPONDYLITIS	6	4	8%
BEHECET'S DISEASE	0	0	-
OSTEOGENESIS IMPERFECTA	1	0	-
SARCOIDOSIS	2	1	2%
SJOGREN'S SYNDROME	3	3	6%
TOTAL	66	50	100%

A total of 66 patients with connective tissue disorders were included in the study, of whom 50 (75.8%) exhibited ocular manifestations. Rheumatoid arthritis was the most common connective tissue disorder, accounting for 35 (53.0%) cases, with ocular involvement observed in 30 patients (60%).

Table 2: Different Type of Anterior Segment Ocular Manifestation

TYPE OF OCULAR MANIFESTATION	NO OF CASES
DRY EYES	33
EPISCLERITIS	6
SCLERITIS	1
ANTERIOR UVEITIS	7
PERIPHERAL ULCERATIVE KERATITIS	4
KERATOCONJUNCTIVITIS SICCA	3
ECTOPIA LENTIS	2
SECONADARY GLAUCOMA	3

Dry eye disease was the most common ocular manifestation, observed in 33 cases (56%).

Table 2: - Different Types of Posterior Segment Ocular Manifestation

TYPE OF OCULAR MANIFESTATION	NO OF CASES
VITRITIS	1
RETINAL VASCULITIS	1
POSTERIOR UVEITIS	2
RETINAL VEIN OCCLUSION	1
RETINAL DETACHMENT	1
OPTIC NEURITIS	0

Posterior segment involvement was observed in a limited number of cases. Posterior uveitis was the most common posterior segment manifestation, seen in 2 cases.

DISCUSSION

Connective tissue disorders (CTDs) are chronic systemic inflammatory diseases with a wide spectrum of ocular manifestations, which may involve the ocular surface, sclera, uveal tract, retina, and optic nerve. Early recognition of ocular involvement is crucial, as it may significantly impact visual prognosis and often reflects underlying systemic disease activity.

In the present study, ocular manifestations were observed in 75.8% of patients with CTDs, highlighting the high burden of ophthalmic involvement in these disorders. A female predominance was noted, which is consistent with the known epidemiology of autoimmune connective tissue diseases, particularly rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), and Sjögren's syndrome. Similar female preponderance has been reported in previous studies evaluating ocular involvement in CTDs.[7,8]

Rheumatoid arthritis was the most common CTD encountered in our study, with ocular involvement observed in 60% of cases. This finding aligns with existing literature, which reports ocular manifestations in 25–60% of patients with RA.[12] The most frequent ocular finding in our cohort was dry eye disease, seen in 56% of cases. Keratoconjunctivitis sicca is well recognized as the most common ocular manifestation of autoimmune connective tissue diseases and may occur either independently or in association with secondary Sjögren's syndrome.[10]

Anterior segment involvement predominated in our study, with dry eye disease, anterior uveitis, episcleritis, and scleritis being the most frequently observed manifestations. Episcleritis and scleritis, though less common than dry eye disease, are clinically significant as they may indicate active systemic inflammation and are often associated with rheumatoid arthritis and systemic vasculitis [10]. Peripheral ulcerative keratitis, although infrequent, was observed in patients with RA and systemic vasculitis, consistent with previous reports describing its association with immune-mediated vasculitis processes [12].

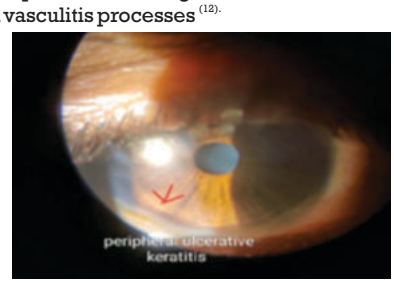

Figure 1; Arrow Shows Peripheral Ulcerative Keratitis Started From 4'0' Clock to 8'0' Clock From Near the Limbus

Posterior segment involvement was relatively uncommon in the present study. Posterior uveitis was the most frequent posterior segment manifestation, followed by retinal vasculitis, retinal vein occlusion, and retinal detachment. These findings are comparable to earlier studies reporting lower prevalence of posterior segment involvement compared to anterior segment manifestations in CTDs [13]. Retinal vasculitis and vascular occlusions, particularly in SLE and systemic vasculitis, are considered markers of severe systemic disease and may warrant aggressive systemic immunosuppression [14].

All patients with Sjögren's syndrome in the present study demonstrated ocular involvement, predominantly dry eye disease. This observation is in agreement with published literature, where ocular surface disease is considered a hallmark of Sjögren's syndrome and often represents the initial clinical manifestation [15]. Marfan's syndrome cases showed lens-related abnormalities, including ectopia lentis, which is a classical ocular feature of this connective tissue disorder [16].

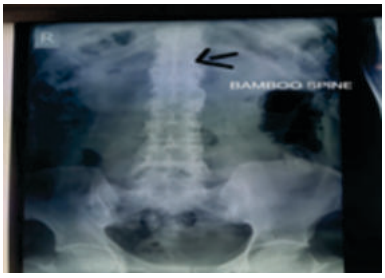

Figure 2: Arrow Mark Showed Bamboo Spine Appearance.

The findings of this study emphasize the importance of routine ophthalmic evaluation in patients with CTDs, even in the absence of visual complaints. Many ocular manifestations, particularly dry eye disease and early uveitis, may be asymptomatic initially but can lead to significant morbidity if left untreated.

Limitations

The limitations of this study include its cross-sectional design, relatively small sample size, and hospital-based setting, which may limit generalizability. Longitudinal studies with larger cohorts are required to assess the progression of ocular manifestations and their correlation with systemic disease activity.

CONCLUSION

Ocular manifestations are frequent and often early indicators of connective tissue disorders, predominantly affecting the anterior segment with dry eye disease being most common. Rheumatoid arthritis showed the highest ocular involvement, while posterior segment complications were relatively uncommon. Regular, comprehensive ophthalmic screening is crucial for early diagnosis, prompt management, and optimization of both visual and systemic outcomes in these patients. Recognition of ocular signs can also provide valuable insight into underlying disease activity, emphasizing the need for multidisciplinary care.

Compliance with Ethical Standards

Acknowledgments

To all the staff and juniors in the department of ophthalmology, SSMC, Tumkur are Acknowledged.

Disclosure of Conflict of Interest

No conflict of interest.

Statement of Informed Consent

Informed consent was obtained from all individual participants included in the study

REFERENCES

1. Spagnolo P, Cordier JF, Cottin V. Connective tissue diseases, multimorbidity and the ageing lung. Eur Respir J. 2016;47(5):1535-1558.
2. Foster CS, Forstot SL, Wilson LA. Mortality rate in rheumatoid arthritis patients developing necrotizing scleritis or peripheral ulcerative keratitis: effects of systemic immunosuppression. Ophthalmology. 1984;91(10):1253-1263.
3. Berwal A, Bairy I, Gupta A. Demystifying antinuclear antibodies and other serological tests in dermatology practice. Clin Dermatol Rev. 2019;3:29.
4. Choudhary MM, Hajj-Ali RA, Lowder CY. Gender and ocular manifestations of connective tissue diseases and systemic vasculitides. J Ophthalmol. 2014;2014:403042.
5. Latha GM, Murthy ESN, Ramadevi, Anuhaya Y. Ocular Manifestations in Cutaneous Autoimmune Connective Tissue Diseases. Int J Pharm Clin Res. 2024 Dec;16(12):420-424.
6. Pawar YB, Thool AR. Ophthalmologic implications of connective tissue diseases: a comprehensive review of current knowledge and innovations. Cureus. 2024 Aug 17;16(8):e67078.
7. Smith JR, Rosenbaum JT. Ocular manifestations of systemic autoimmune diseases. Curr Opin Ophthalmol. 2001;12(6):513-519.
8. Foster CS, Vitale AT. Diagnosis and Treatment of Uveitis. 2nd ed. Philadelphia: Elsevier Saunders; 2013.
9. Akpek EK, Smith JA. Ocular manifestations of rheumatoid arthritis. Curr Opin Ophthalmol. 2013;24(6):540-547.
10. Kassan SS, Moutsopoulos HM. Clinical manifestations and early diagnosis of Sjögren syndrome. Arch Intern Med. 2004;164(12):1275-1284.
11. Watson PG, Hayreh SS. Scleritis and episcleritis. Br J Ophthalmol. 1976;60(3):163-191.
12. Messmer EM, Foster CS. Vasculitic peripheral ulcerative keratitis. Surv Ophthalmol. 1999;43(5):379-396.
13. Sivaraj RR, Durrani OM, Denniston AK, Murray PI, Gordon C. Ocular manifestations of systemic lupus erythematosus. Rheumatology (Oxford). 2007;46(12):1757-1762.
14. Stafford-Brady FJ, Urowitz MB, Gladman DD, Easterbrook M. Lupus retinopathy. Arthritis Rheum. 1988;31(9):1105-1110.
15. Fox RI. Sjögren's syndrome. Lancet. 2005;366(9482):321-331.
16. Maumenee IH. The eye in the Marfan syndrome. Trans Am Ophthalmol Soc. 1981;79:684-733