

Original Research Article

Assessment of ocular surface diseases in systemic autoimmune conditions

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ABSTRACT

Background: Ocular surface inflammation causing dry eye disease (DED) develops in numerous systemic inflammatory/autoimmune conditions. This study aimed to assess the association between ocular surface disorders and psychological and physiological situations among systemic autoimmune patients.

Methods: This cross-sectional study included 60 autoimmune rheumatic patients (120 eyes) visiting the department of ophthalmology at BSMMU, Dhaka, Bangladesh from January 2023 to December 2023. Patients were 18 to 80 years old. Pearson and spearman's analysis were conducted to examine the relationship between systematic conditions and ocular surface conditions. $P < 0.05$ was regarded as statistically significant.

Results: The analysis considered the age and sex of the participants. In the study, a higher percentage of autoimmune rheumatic patients' eyes had DED compared to the control group. Autoimmune rheumatic patients also had higher OSDI scores, lower tear secretion, more severe CFS, and conjunctivochalasis. Additionally, they had lower SF-36 scores, higher anxiety, and HAQ-DI scores.

Conclusions: Factors such as quality of life, anxiety, depression, and sleep quality are linked to ocular surface conditions, particularly DED symptoms. The management of systemic conditions and psychotherapy should also be considered as part of the treatment for autoimmune rheumatic patients.

Keywords: Anxiety and depression, Autoimmune rheumatic diseases, Dry eye disease, Ocular surface, Quality of life, Systemic autoimmune conditions

INTRODUCTION

Immune system rheumatic maladies are inveterate conditions that influence numerous frameworks, such as rheumatoid joint pain (RA), systemic lupus erythematosus (SLE), and Sjogren's disorder (SS). Patients with these illnesses are frequently hospitalized due to extreme joint pain, nephritis, or interstitial pneumonia, and may not pay sufficient consideration to visual changes, especially in RA and SLE.¹⁻³ Investigate demonstrates that visual association is a sign of resistant reactivation in numerous rheumatic infections, and it is

very common. For occasion, 90% of SS patients, 27% of RA patients, and 31% of SLE patients encounter visual issues. Among these, visual surface clutters, especially dry eye illness (DED), are habitually detailed and speak to the most common visual clutter.⁴ Early eye examination and intercession play a vital part in the forecast and result of these maladies.^{5,6} Moreover, in SS patients, visual examination helps in the conclusion.⁷ Visual surface disarranges can cause obscured vision and diminished visual keenness, driving to diminished work proficiency, affecting quality-of-life, and expanding money related burden.^{8,9} In patients with immune system

rheumatic maladies, the seriousness of the infection can influence push levels, uneasiness, and rest quality.^{10,11} Passionate clutters, destitute rest, and certain immunomodulatory medicines have been appeared to decline visual surface conditions, especially worsening dry eye indications, which can influence the determination and evaluation of immune system rheumatic infections.¹¹⁻¹⁴ This makes a horrendous cycle. Right now, restricted investigate investigates the coordinate relationship between the physical and mental states and visual surface conditions in patients with immune system rheumatic illnesses.¹⁵ Here are five surveys that we have chosen to comprehensively survey the physical and mental states of RA, SLE, and SS patients. The visual surface malady file (OSDI) is a broadly utilized survey to assess subjective visual surface conditions in DED patients, counting the recurrence of visual indications.^{16,17} The brief shape 36-health overview (SF-36) is a common quality-of-life survey created by the American Restorative Inquire about Gather.^{18,19} It is broadly utilized and incorporates the physical component outline (PCS) and mental component rundown (MCS) subscales. The wellbeing appraisal questionnaire-disability list (HAQ-DI) measures troubles in exercises of everyday living.²⁰ It was initially created to survey physical work in immune system rheumatic patients.²¹ The healing centre uneasiness and sadness scale (HADS) is one of the most commonly utilized devices for screening uneasiness and sadness in incessant physical infections.²²⁻²⁴ The Pittsburgh rest quality list (PSQI) is a 19-item self-report survey that measures subjective rest quality in patients with natural or nonorganic rest disarranges over the past 1 month.^{25,26} This ponder points to provoke the part of visual surface infections in systemic immune system conditions in terms of quality of life and mental condition. Patients' assent and moral clearance were guaranteed earlier to the study.

Objective

General objective

The objective of this study was to assess the ocular surface diseases in systemic autoimmune conditions.

Specific objective

This study aimed to assess the ocular surface diseases in systemic autoimmune conditions based on patients' age, mental condition and quality of life.

METHODS

This cross-sectional study included a total of 120 eyes of 60 patients, who were 18 to 80 years old. These patients visited the department of rheumatology and were referred to the department of ophthalmology, at Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh for the treatment of ocular surface diseases (OSD), from January 2023 to December 2023. Among these 60

patients, 45 were in the control group with OSD in systemic autoimmune condition whereas 15 patients were in the open group consisting of volunteers without autoimmune rheumatic diseases matched for sex and age.

Inclusion criteria

Patients aged more than 18 years to 80 years, 18-80, diagnosed with RA, SLE and pSS by a rheumatologist were included. The open group inclusion criteria were age: 18-80 and no autoimmune rheumatic diseases.

Exclusion criteria

Patients with a history of eye surgery, eye trauma, and ocular medication history within 1 month, lactating or pregnant women, diabetes, hypertension, cardiovascular disease, thyroid-associated ophthalmopathy, eyelid eversion, computer workers, and contact lenses within 1 month were excluded from this study.

The diagnostic criteria for RA, SLE, and SS were based on the 2010 American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) classification criteria for RA, 2019 EULAR/ACR Classification Criteria for SLE, and 2016 EULAR/ACR Classification Criteria for SS respectively.²⁷⁻³¹ All participants underwent assessments for ocular surface disorders, including dry eye disease (DED), using the ocular surface disease index (OSDI) for symptom evaluation, as well as slit lamp examinations for tear break-up time (TBUT), meibomian gland secretion, symblepharon and corneal clarity, Schirmer I test, corneal fluorescein staining (CFS), and lid-parallel conjunctival folds (LIPCOF). Systematic conditions were evaluated using the short form 36-health survey (SF-36) for health-related quality of life, the hospital anxiety and depression scale (HADS) for anxiety and depression, the health assessment questionnaire disability index (HAQ-DI) for difficulties in activities of daily living, and Pittsburgh sleep quality index (PSQI) for sleep quality. Pearson and Spearman's analysis was conducted to examine the relationship between systematic conditions and ocular surface conditions. A p value of <0.05 was considered statistically significant. Ethical clearance was obtained from the hospital authority, and well-informed written consent was taken from the patients.

RESULTS

Among 45 patients in the control group, 38 were male and 7 were female and in the open group with an average age of 24.87 ± 7.89 , 11 were male and 4 were female with an average age of 22.13 ± 10.29 years (Table 1). The control patients had more severe ocular surface symptoms than the open group, measured by the OSDI score (17.92 ± 17.40 and 10.07 ± 14.75 , respectively, $p=0.03$). The control group showed less tear secretion than the open group measured by the Schirmer I test (9.19 ± 8.44 and 12.80 ± 10.25 , respectively, $p=0.007$). For

corneal fluorescein staining, 25.56% of eyes (46 in 180) of patients had abnormal CFS grade and significantly higher than 5.00% of eyes (3 in 60) of the open group ($p < 0.001$). Interestingly, there were more abnormal meibomian gland secretions in the open group than in the patients (50.00% and 41.11%, respectively) but the difference was not statistically significant ($p = 0.23$). The LIPCOF grade was abnormal in 25.00% of the control group patients and 18.33% of the open group ($p = 0.003$).

Additionally, no eyes were found to have symblepharon (Table 2). Table 3 showed that lower SF-36 composite scores were in the control group patients than in the open group, indicating that autoimmune rheumatic diseases obviously reduced patients' health-related quality of life ($p < 0.001$). The anxiety scores were significantly higher in autoimmune rheumatic patients than in controls (6.89 ± 4.37 and 4.92 ± 3.78 respectively, $p = 0.04$) (Table 4).

Table 1: Age-gender characteristics of the study patients.

Characteristics	Variables	Control group n=45	Open group n=15	P value
Age in years		24.87±7.89	22.13±10.29	0.10
Gender ratio Female: Male	18-40	13: 1	6: 2	0.27
	41-60	17: 2	2: 1	0.32
	61-80	10: 2	3: 1	0.86

Table 2: The ocular surface disorders of the study participants.

Characteristics	Variables	Control group n=45	Open group n=15	P value
OSDI score		24.87±7.89	22.13±10.29	0.10
OSDI level, N (%)	0 (0–12)	23 (51.11%)	11 (73.34%)	
	1 (13–22)	8 (18.89%)	2 (13.33%)	
	2 (23–32)	4 (8.89%)	0	
	3 (≥33)	10 (21.11%)	2 (13.33%)	
Eyes (n=120)		90	30	
Schirmer I test (mm/5 min)		9.19±8.44	12.80±10.25	0.007
Schirmer I test level, N (%)	Normal (>10 mm/5 minutes)	33 (36.11)	14 (46.67)	
	Abnormal (≤10 mm/5 minutes)	57 (63.89)	16 (53.33)	
TBUT (s)		5.76±3.19	6.40±3.41	0.18
TBUT level, N (%)	Normal (> 10 s)	11 (11.67)	4 (13.33)	
	Abnormal (≤10 s)	79 (88.33)	26 (86.67)	0.73
Corneal fluorescein staining, N (%)	Normal (Grade 0)	67 (74.44)	28 (95.00)	
	Abnormal (≥Grade 1)	23 (25.56)	2 (5.00)	<0.001*
Meibomian gland secretion, N (%)	Normal (Grade 0)	53 (58.89)	15 (50.00)	
	Abnormal (≥Grade 1)	37 (41.11)	15 (50.00)	0.23
LIPCOF, N (%)	Normal (Grade 0)	68 (75.00)	25 (81.67)	
	Abnormal (≥Grade 1)	23 (25.00)	6 (18.33)	
Symblepharon presence, N (%)	Normal	90 (100)	30 (100)	
	Abnormal	0	0	-
Corneal clarity, N (%)	Normal	89 (98.89)	30 (100)	
	Abnormal	1 (1.11)	0	0.56
Dry eye level, N (%)	No dry eye 8	3 (47.78)	24 (78.33)	
	I	15 (17.22)	1 (3.33)	
	II	18 (20.00)	3 (10.00)	
	III	13 (15.00)	3 (8.33)	
	IV	0	0	<0.001
Classification of dry eye, N (%)	No dry eye	43 (47.78)	47 (78.33)	
	Aqueous deficiency dry eye	19 (20.56)	3 (10.00)	
	Evaporative dry eye	14 (16.11)	1 (3.33)	
	Mixed dry eye	14 (15.56)	3 (8.33)	<0.001

*Statistically significant.

Table 3: SF-36 characteristics of the study participants.

Variables	Control group n=45	Open group n=15	P value
Composite score	49.65±20.43	79.66±18.19	<0.001*
PCS score	42.34±22.55	81.78±19.11	<0.001*
MCS score	56.36±21.34	78.55±18.26	<0.001*
PF score	61.36±19.53	94.04±10.10	<0.001*
RP score	21.36±36.34	86.54±33.34	<0.001*
BP score	49.36±30.34	84.42±18.94	<0.001*
GH score	38.36±21.21	63.12±25.85	<0.001*
VT score	57.36±21.10	68.85±21.12	0.03
SF score	64.36±21.28	78.46±18.34	<0.001*
RE score	39.36±45.23	83.33±34.32	<0.001*
MH score	64.36±21.34	68.54±1910	0.26

*Statistically significant.

Table 4: HAQ-DI characteristics of the study participants.

Variables	Control group n=45	Open group n=15	P value
HAQ-DI score	0.64±0.85	0.04±0.3	<0.001*
HAQ-DI level, N (%)			
1	30 (66.67)	15 (100)	0.001*
2	3 (6.67)	0	
3	4 (8.89)	0	
4	2 (5.55)	0	
5	4 (8.89)	0	
6	2 (3.33)	0	

*Statistically significant

DISCUSSION

Immune system rheumatic illnesses are long-term conditions characterized by an overactive and uncontrolled safe reaction that influences different organs of the body, including the eyes.^{1,3,32} The correct causes of these conditions are not completely caught on. Due to their inveterate nature and need for a conclusive remedy, patients regularly encounter both physical torment and mental stretch. Moreover, people with immune system rheumatic illnesses too confront expanded challenges in their everyday lives.^{1,3,32} It appeared that immune system rheumatic patients had a lower quality of life compared to the open gather, with both physical and mental well-being being influenced. Part physical was the most affected pointer. The discoveries adjust with past reports and propose the significance of comprehensive physical and mental well-being care for immune system rheumatic maladies. Furthermore, these illnesses decline everyday living, steady with Lorand's consider.³² Patients with immune system rheumatic illnesses regularly encounter expanded levels of uneasiness and diminished rest quality. The National Organized for Wellbeing and Care Brilliance (Decent) rules suggest intermittent appraisals

to assess the effect of the infection on the patients' lives, counting their quality of life and disposition.

Besides, in expansion to customary medicines, mental mediations such as unwinding procedures and cognitive adapting abilities are suggested to offer assistance patients alter to living with their condition.^{1,2,32}

Patients with immune system rheumatic infections frequently involvement eye issues, especially issues with the surface of the eye such as conjunctivitis, keratitis, and dry eye infection. An observational ponder found that among

patients with essential and auxiliary Sjögren disorder, 46% had meibomian organ brokenness, 49% had shallow punctate keratopathy, and 44% had abbreviated tear breakup time (TBUT). The consider too uncovered that among immune system rheumatic patients, 48.89% appeared visual indications, 63.89% had decreased tear discharge, 88.33% had abbreviated TBUT, 25.56% had corneal fluorescein recolouring, 41.11% had unusual meibomian organ discharge, 25% had LIPCOF, with no cases of symblepharon and 1.11% appearing corneal darkness. Besides, 52.22% of patients were analyzed with dry eye illness (DED), with 20.56% having the watery lack sort, 16.11% having the evaporative sort, and 15.56% having the blended sort. This condition is connected to an overactive and uncontrolled safe reaction where the tear organs assaulted by autoantibodies fall flat to create tears, driving to a lower tear generation compared to the open bunch. The think about too found that the contrast in tear film soundness was not factually critical between patients with immune system rheumatic maladies and the open gather, which adjusts with past investigate conducted by Guannan et al.³²

The fundamental cause of dry eye malady (DED) in most immune system rheumatic infections is the central lymphocytic invasion and constant irritation of the exocrine organs, or maybe than meibomian organ brokenness.³² This clarifies why most sorts of DED

related with immune system rheumatic infections are of the aqueous-deficient sort.³² In assessing the seriousness of dry eye, corneal fluorescein recoloring is an imperative record.³² It has been found that immune system rheumatic patients show more serious corneal recoloring compared to the open gather. Liang's investigate too bolsters this perception.³² Currently, there is a developing conviction that visual surface disarranges, particularly DED, are related with mental, psychosocial, and social components, especially uneasiness and discouragement. Thinks about have appeared that in a sound populace, decreased rest term, higher mental push, and poorer self-perceived wellbeing status were freely related with DED. Furthermore, ponders have illustrated that patient with immune system rheumatic conditions involvement a diminished quality of life, poorer rest quality, and an expanded chance of uneasiness and sadness. For patients with SS, mental components altogether affect the quality of life, well-being, cognitive capacities, and illness action. Visual indications such as torment, dryness, and tingling can cause physical restrictions and mental trouble.³² Analysts propose that a biopsychosocial point of view is pivotal for treatment.³² In any case, there is a need of inquire about on the relationship between the physical and mental state and visual surface disarranges in patients with rheumatoid joint pain (RA) and systemic lupus erythematosus (SLE).

This investigate illustrates that, not at all like the open bunch, lower health-related quality of life, more uneasiness and misery, and poorer rest quality were modestly related with DED side effects among immune system rheumatic patients. DED is an illness in which side effects and signs are isolated concurring to DEWS II.¹⁶ No critical affiliation was watched between other visual surface signs and systemic components. It demonstrates that dry eye malady (DED) influences the health-related quality of life, uneasiness, sadness, and rest quality of rheumatic resistant patients more than individuals without immune system rheumatic infections. These systemic conditions can disturb DED. Administration of systemic issues is fundamental when treating immune system rheumatic patients. Progressing the patient's physical and mental condition is moreover advantageous to DED. All-encompassing considering is essential when treating a persistent with immune system rheumatic disease-related visual association. Tending to comorbid conditions such as sadness and destitute rest quality is vital, as these can compound one another and contribute to the in general burden of illness.^{10,32}

It is vital to note that patients with dry eye malady may display diverse illness states in each eye. For illustration, a persistent encountering uneasiness may be analyzed with dry eye in one eye whereas the other eye remains typical. To dodge potential predisposition, we found the middle value of the visual surface records of both eyes for each understanding some time recently conducting a relationship examination with systemic pointers.³² Besides, it's fundamental to consider the effect of sex and

age on dry eye illness (DED), indeed in spite of the fact that this considers coordinated age and sex. The chance of DED increases with age in both genders, with higher frequency among females. Moreover, the onset or compounding of dry eye in maturing ladies may be impacted by the condition of menopause due to in general hormonal lopsidedness.³²

Limitations of this study are the disease group we studied only included hospitalized patients and ignored non-hospitalized patients. Hospitalized patients with autoimmune rheumatism are more severe and have more comorbidities than those who are not hospitalized. This will cause bias to some extent. Also, the small sample size may affect the study outcome.

CONCLUSION

Based on the current study, individuals with autoimmune rheumatic conditions experience a lower quality of life, face more challenges in their day-to-day activities, and are prone to ocular surface disorders. The findings suggest that in addition to managing the underlying systemic conditions, psychotherapy should be considered as part of the treatment, as it may provide benefits for managing ocular surface disorders in individuals with autoimmune rheumatic conditions.

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