

Ocular Manifestations in Patients Diagnosed with Rosacea: A Cross-sectional Study from a Tertiary Care Centre in Northern India

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ABSTRACT

Introduction: Rosacea is a chronic inflammatory disease that affects the facial skin with eye involvement, that remains underdiagnosed. It is generally noticeable in fair skin people and often missed out in people with darker skin.

Aim: To study the prevalence of ocular rosacea in patients of rosacea in a tertiary care centre.

Materials and Methods: The present study was a cross-sectional study conducted at two tertiary level hospitals from January 2020 to December 2021. Cases of rosacea diagnosed were referred from the Department of Dermatology to the Department of Ophthalmology for ocular evaluation. A total of 400 patients were included in study in a multicentric setting. For ophthalmic evaluation, Ocular Surface Disease Index (OSDI) questionnaire was used.

Results: Total 29 cases (7.25%) had ocular rosacea, out of 400 dermatological confirmed cases of rosacea. Amongst confirmed ocular rosacea, 12 (41.4%) were males and 17 (58.6%) were females. Most manifestations were noted in 41-60 years age with an average age of 52.2 years. Most of the cases presented with multiple symptoms and signs, 19 presented with features of dry eyes, 16 had features of conjunctivitis, six had blepharitis, and seven had recurrent chalazions.

Conclusion: Ocular rosacea is a diagnostic enigma to clinicians as it is underdiagnosed because of overlapping sign and symptoms. The present study emphasises ocular examination in all cases of rosacea.

Keywords: Blepharitis, Hypersensitivity, Inflammatory disease, Ocular rosacea

INTRODUCTION

Rosacea is a chronic progressive dermatosis of relatively unknown aetiology with multifactorial association. Aggravation is often noted with exposure to heat, ultraviolet rays and spicy food. It is noticeable in people with fair skins but is often missed in people with darker skins [1,2]. Cutaneous rosacea is characterised by inflammatory papules, pustules, erythema of cheeks, nose, forehead, chin and front of the neck. Rhinophyma is secondary to sebaceous gland hypertrophy and is typical of rosacea [3]. Dermatological manifestations are more common with women between 40-50 years of age in western world, however, ocular manifestations have equal predilection for both the genders. Men generally show symptoms in sixth decade of life [4,5].

Ocular rosacea has been reported upto as high as 58% depending upon skin colour of the target population [5]. In routine practice, many cases were managed as allergic conjunctivitis or primarily an ocular morbidity turned out to be rosacea, later on [5]. Dermatological manifestations are conventionally categorised as erythematotelangiectatic, papulopustular, phymatous and ocular rosacea [6]. National Rosaceae Society has classified rosacea into four subtypes: erythematotelangiectatic, papulopustular, phymatous, and ocular [7]. It is emphasised that these aren't discreet categories, and rather varied manifestations of the same spectrum of syndromes with interchangeability of phenotypes [7,8]. These categories or stages of rosacea overlap with each other and any one of the above findings aid in the diagnosis.

Ocular manifestations range from periorbital lymphoedema, telangiectasia of lid, blepharitis, conjunctivitis, scleritis to keratitis in various and overlapping combinations. Common symptoms are watery eyes, dryness, itching, blurring of vision, light sensitivity, burning and/ or foreign body sensation, redness of eyes, meibomian gland disorders presenting as repeated chalazions. Common signs are erythema in periorbital area and lids, telangiectasia, punctate or marginal keratitis to severe presentations as corneal vascularisation,

corneal thinning, scarring and even perforation [7-9]. Akpek EK et al., found 41% of 131 patients with a diagnosis of ocular rosacea had corneal involvement of varying degrees. The most frequent corneal finding is an inferior superficial punctate keratitis. However, corneal vascularisation, thinning, scarring, and perforation have been described [10]. Upto 20% of patients presented to ophthalmic clinics before skin specialist because most common ocular manifestation of rosacea are non specific. Diagnosis becomes further difficult in patients having no cutaneous manifestations. Presently, there are no confirmatory tests for ocular rosacea [10].

The aim of the study was to evaluate the prevalence of ocular signs in diagnosed cases of rosacea patients in northern India. Most of the studies have been conducted in the western world where the skin type is Fitzpatrick I-III, and this ethnic variation of skin type as compared to Indian skin types IV-VI, the degree of involvement of eyes provide a clue to type and incidence of ocular manifestations. The present study will help understand the significance of ocular involvement in rosacea and thus, emphasise the importance of early ophthalmic examination in all rosacea patients for early detection to prevent significant ocular morbidity.

MATERIALS AND METHODS

This was a multi-institutional cross-sectional study conducted in two tertiary level hospitals with ophthalmic and dermatological facilities of Northern India, from January 2020 to December 2021. Ethical clearances were taken from the Institutional Ethical Committees (IEC). (Letter No. IEC/BHDC/05/2020 & IEC/CHWC/15/2020).

A total of 400 patients of rosacea were referred from the Department of Dermatology to the Department of Ophthalmology for ocular evaluation after obtaining consent.

Sample size calculation: Sample size was calculated keeping 95% confidence level and 05% margin of error using the formula:

$$n = Z^2 P(1-P) / d^2$$

where n is sample size, d is margin of error, P is population proportion which is taken as 50%, population size taken into consideration was unlimited [8]. (Minimum sample size required was 385).

Inclusion criteria: Dermatologically diagnosed cases of rosacea were included in study. Cases with dry eyes, recurrent chalazions, non specific blepharitis, conjunctivitis, keratitis, corneal thinning, scarring and opacities were also referred from eye clinics to skin clinics for evaluation. Once confirmed as a case of rosacea, they were also included in the study.

Exclusion criteria: Cases with diabetes mellitus, seborrhoeic dermatitis, acne, cutaneous or systemic connective tissue disorders, known cataract and/or glaucoma were excluded from the study.

For ophthalmic evaluation, OSDI questionnaire was followed [9]. All patients diagnosed with rosacea clinically by dermatologist, were referred to the Ophthalmology Department and slit lamp examination was performed.

STATISTICAL ANALYSIS

Subgroup analysis for sex, age groups of 20 years variation and ophthalmic manifestations were performed. Being a descriptive study, percentages were used to describe the findings.

RESULTS

Total 29 cases (7.25%) had ocular rosacea, out of 400 dermatological confirmed cases of rosacea. Amongst confirmed ocular rosacea, 12 (41.4%) were males and 17 (58.6%) were females. Most manifestations were noted in 41 to 60 years age with an average age of 52.2 years [Table/Fig-1]. Some of the ocular signs and symptoms in age-wise distribution are shown in [Table/Fig-2,3].

Age groups (years)	Males (112)		Females (288)	
	Skin rosaceae	Ocular rosaceae	Skin rosaceae	Ocular rosaceae
<20	2	0	4	1
21-40	11	2	31	3
41-60	71	7	155	9
61-80	19	2	65	3
>80	9	1	33	1
Total	112	12	288	17

[Table/Fig-1]: Demographic pattern.

Age groups (years)	Itching	Watering	Lid swelling	Nodules in lids	Red eyes	Diminution of vision	Total
<20	00	00	00	01	00	00	01
21-40	02	04	01	02	03	00	12
41-60	11	10	03	03	09	01	37
>60	06	05	02	01	04	02	20
Total	19	19	06	07	16	03	70

[Table/Fig-2]: Ocular symptoms.
*Overlap of symptoms seen in most of cases

Age groups (years)	Peri-orbital oedema	Bleph-aritis	Conjunc-tivitis	Cha-lazion	Telangi-ectasia	Dry eyes	Cata-ract	Glau-coma
<20	00	00	00	00	01	00	00	00
21-40	00	01	01	01	01	01	00	00
41-60	03	03	11	04	01	16	01	01
>60	02	02	04	02	00	02	02	00
Total	05	06	16	07	03	19	03	01

[Table/Fig-3]: Ocular signs.

Most of the cases presented with multiple symptoms and signs- 19 presented with features of dry eyes, 16 had features of conjunctivitis [Table/Fig-4,5], six had blepharitis, and seven had recurrent chalazions.

Five patients of recurrent chalazions and blepharitis first reported to the Ophthalmology clinic and were sent to the Dermatology OPD with a suspicion and were confirmed to have rosacea.



[Table/Fig-4]: Conjunctivitis with telangiectasia.
[Table/Fig-5]: Dryness of the eye. (Images from left to right)

DISCUSSION

Ocular rosacea is a lesser interacted entity in the clinics and hence, often missed. The present study was aimed to sensitise dermatologists and ophthalmologists to emphasise the co-existence of ocular manifestations in patients with an established diagnosis of rosacea. Overall, 29 (7.25%) of the total 400 cases were referred to the Ophthalmology OPD. This was towards the lower side of the reported prevalence, elsewhere [1-6]. A female preponderance was noted in the present study (17 females and 12 males), which matches with most of the other published studies [1-6]. The disease has a peak incidence in the fifth and sixth decades of life [1,11]. Kaur T et al., reported a prevalence of 41.62% [12]. Jabbehdari S et al., reported figures, as high as 75% [9].

The most commonly observed finding was the persistent dryness of the eyes (65.52%) which was similar to other studies conducted on a population with darker skin tones (39.5 to 56.67%) [2,9,12]. Pruritus and excessive lacrimation were the other commonly found complaints in the study (65.52%). Similarly, Kaur T et al., also reported 6.67% of cases with excessive watering of eyes [12]. Features of xerosis (dry eyes, 65.52%) were the most common signs which were comparable with study done by Kaur T et al., (66.67%). There were only 3 (10.34%) cases of telangiectasia as compared to the study by Kaur T et al., (30%) [12]. Also, Akpek EK et al., also reported telangiectasia of lid margins to be as high as 63% [10]. Chalazion was noted in 24%, while Kaur T et al., reported it to be 26% [12]. In the present study, blepharitis was noted in 20.7% of the patients. There were 3 (10.34%) cases of grade I senile cataract with posterior subcapsular opacities with good vision and 1 (3.34%) with open angle glaucoma. The most commonly encountered ocular manifestations were of meibomian gland dysfunction, conjunctivitis, blepharitis, and dry eyes. None of the patients presented with episcleritis, scleritis, iridocyclitis, hypopion, corneal ectasia, corneal scarring, corneal opacities and corneal vascularisation.

The aetiology of ocular rosacea is relatively unknown. Current hypothesis focus on the dysfunction of the immune, vascular, and neurovascular systems, which seem to be at the heart of pathogenesis, triggered by microbial or physical stimuli [9]. Since, meibomian glands, vessels, and immune cells, such as mast cells, are controlled by autonomous system innervation; it could be hypothesised that the manifestations of ocular rosacea could result from peripheral innervation deregulation, favoured by hormonal, infectious, and physical factors [12]. Despite the vascular response a large show is due to meibomian gland dysfunction leading to tear film instability and reduced Tear film Break-up Time [13]. Type-IV hypersensitivity has been attributed to the perivasculitis and granulomatous inflammation. Complement C3 and immunoglobulins have detected in the epithelium and basement membranes in cases with severe ocular manifestations like, scleritis, keratitis and corneal vascularisation suggestive of chronic inflammatory activities [14].

Limitation(s)

Being a descriptive and observational study, results may reflect some bias due to the absence of statistical tests and the population is only native or residing in a particular area. Transiently these results cannot be accurately be applied on a general population. Since, there is no gold standard for confirmation of the diagnosis, certain factors require further study.

CONCLUSION(S)

Despite major advances in understanding the pathophysiology of cutaneous and ocular rosacea, the exact mechanisms are still poorly understood. The present study emphasises on importance of ocular examination in all cases of rosacea as eye involvement has got more morbidity and early detection with early intervention can produce significant reduction in ocular rosacea symptoms. Ocular rosacea is a diagnostic enigma to clinicians, as it is underdiagnosed because of overlapping sign and symptoms. The present study emphasises ocular examination, in all cases of rosacea.

REFERENCES

- [1] Two AM, Wu W, Gallo RL, Tissa R, Hata TR. Continuing medical education. Rosacea Part I. Introduction, categorization, histology, pathogenesis, and risk factors. *J Am Acad Dermatol.* 2015;72(5):749-58.
- [2] Balbeesi AO, Almukhadeb EA, Halawani MR, Bin Saif GA, Al Mansouri SM. Manifestations of ocular rosacea in females with dark skin types. *Saudi J Ophthalmol.* 2019;33(2):135-41.
- [3] Soby P. Aetiology and pathogenesis of rosacea. *Acta Derm Venereol.* 1950;30:137-58.
- [4] Borrie P. Rosacea with special reference to its ocular manifestations. *Br J Dermatol.* 1953;65(12):448-57.
- [5] Marks R. Concepts in the pathogenesis of rosacea. *Br J Dermatol.* 1968;80(3):170-71.
- [6] Rainer BM, Kang S, Chien AL. Rosacea: Epidemiology, pathogenesis, and treatment. *Dermatoendocrinology.* 2017;9(1):01-10.
- [7] Gallo RL, Granstein RD, Kang S, Mannis M, Steinhoff M, Tan J, et al. Standard classification and pathophysiology of rosacea: The 2017 update by the National Rosacea Society Expert Committee. *J Am Acad Dermatol.* 2018; 78(1):148-55.
- [8] Glenn D. 1992 Determining Sample Size PEOD-6 Israel Cochran W. G. 1963 Sampling Techniques, 2nd Ed, New York: John Wiley and Sons, Inc.
- [9] Jabbehdari S, Memar OM, Caughlin B, Djallilian AR. Update on the pathogenesis and management of ocular rosacea: An interdisciplinary review. *Eur J Ophthalmol.* 2021;31(1):22-33.
- [10] Akpek EK, Merchant A, Pinar V. Ocular rosacea: Patient characteristics and follow-up. *Ophthalmology.* 1997;104(11):1863-67.
- [11] Gudmundsen KJ, O'Donnell BF, Powell FC. Schirmer testing for dry eye in patients with rosacea. *J Am Acad Dermatol.* 1992;26 (2 Pt 1):211-14.
- [12] Kaur T, Sethi A, Mittal N, Singh K. Ocular rosacea: The insight. *IP Indian J Clin Exp Dermatol.* 2020;6(2):194-99.
- [13] Pflugfelder SC, Tseng SC, Yoshino K, Monroy D, Felix C, Reis BL. Correlation of goblet cell density and mucosal epithelial membrane mucin expression with rose bengal staining in patient with ocular irritation. *Ophthalmology.* 1997;104(2):223-35.
- [14] Thanh HX, Rodriguez A, Zaltas MM, Rice BA, Foster CS. Ocular rosacea: A histologic and immunopathologic study. *Ophthalmology.* 1990;97(11):1468-75.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Jun 16, 2022
- Manual Googling: Oct 19, 2022
- iThenticate Software: Oct 21, 2022 (10%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jun 11, 2022**

Date of Peer Review: **Jul 12, 2022**

Date of Acceptance: **Oct 22, 2022**

Date of Publishing: **Nov 01, 2022**