



Pattern and management of Peripheral ulcerative keratitis (PUK) in Bangladeshi patients

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Abstract

Objective: *In this study our main goal is to evaluate the pattern and management of peripheral ulcerative keratitis (PUK) in Bangladeshi patients.*

Method: *This observational study was done in the in the National Institute of Ophthalmology & Hospital from January 2019 to January 2019. A total of 150 consecutive patients were included. The diagnosis PUK was made on the basis of presence of crescent-shaped destructive inflammation within at least 2 mm of limbus associated with epithelial defect, stromal inflammatory cells and possibly stromal degradation.*

Result: *during the study, the mean random blood sugar was 11.5 ± 5.5 mg/dl in patients. 37% patients had blurred vision, followed by 24% had increased sensitivity to bright light, 39% had a sensation of a foreign object trapped in the eye. Mooren's ulcer present in 32% cases followed by microbiological infection 39% and systemic collagen vascular disease 29 %.*

Conclusion: *From our study we can conclude that, that the management of such cases, underscores the need for a detailed workup, regular follow up and specialties. Consultation patients with PUK require thorough ocular and systemic investigations to detect the aetiology on which the treatment is based. Surgical intervention in perforated cases had good visual prognosis and anatomical success. In spite of complete resolution, continued, possibly lifelong is necessary since relapse may occur.*

Keyword: *Peripheral ulcerative keratitis (PUK), crescent-shaped destructive inflammation, ocular and systemic pattern.*

Introduction

Peripheral ulcerative keratitis (PUK) is a potentially devastating disorder consisting of a crescent-shaped destructive inflammation at the margin of corneal stroma associated with an epithelial defect, presence of stromal inflammatory cells and progressive stromal degradation and thinning.¹

PUK has an incidence of 3 cases per million per year. There is an equal prevalence of males and females. PUK has been associated with many autoimmune disorders.²

It is a potentially devastating disorder which can present at any age.³ The unique anatomical and physiological characteristics of peripheral cornea explain its predilection for PUK.⁴ It may be the

presenting manifestation of a potentially lethal systemic auto-immune vasculitic disease.² Because of the varied etiologies of PUK, appropriate management requires the establishment of correct diagnosis. Dermatological, neurological, traumatic, infectious and post infectious disorders, abnormalities of the eyelids, systemic and local autoimmune diseases should be considered in the differential diagnosis of PUK.^{4–12} Antimicrobial therapy, systemic tetracycline, lid hygiene, correction of anatomical lid problems, punctal occlusion and temporary or permanent tarsorrhaphy may be required.⁵ However, in patients with an underlying collagen vascular disorder, systemic therapy with immunosuppressive and immunomodulator agents may decrease the likelihood of ocular morbidity. In this study our main goal is to evaluate the pattern and management of peripheral ulcerative keratitis (PUK) in Bangladeshi patients.

Objective

General Objective

- To assess the pattern and management of peripheral ulcerative keratitis (PUK) in Bangladeshi patients.

Specific Objective

- To detect baseline investigations findings of patients.
- To identify symptoms of the peripheral Ulcerative Keratitis.

Methodology

Type of study	Observational study.
Place of study	National Institute of Ophthalmology & Hospital
Study period	January 2019 to January 2019
Study population	150 consecutive patients of PUK who presented to the Cornea Services.
Sampling technique	Purposive

Method

The diagnosis PUK was made on the basis of presence of crescent-shaped destructive inflammation within at least 2 mm of limbus associated with epithelial defect, stromal inflammatory cells and possibly stromal degradation. Patient details such as age, sex, socioeconomic status was noted. A detailed history was taken regarding the duration and type of symptoms, systemic associations and treatment taken. A meticulous ocular examination was done which included record of best corrected visual acuity (BCVA) and detailed slit lamp examination during which the involved quadrant (nasal, temporal, superior and inferior), extent of epithelial defect, infiltration, thinning (in clock hours in greatest and smallest meridian) and depth of corneal involvement were noted.

Statistical Analysis

Data were processed and analyzed using computer-based software SPSS (Statistical Package for Social Sciences) for windows version 22. Unpaired t-test was used to compare quantitative variables. Variables were expressed as range and mean \pm SD. p value $<$ 0.05 were taken significant. Students' t test, Pearson's correlation coefficient test, multivariate logistic regression analysis and Fisher's exact test as applicable.

Result

In table-1 shows age distribution of the patients where most of the patients (35.5%) belongs to age group 50-60 years. The following table is given below in detail:

Table-1: Age distribution of the patients

Variable	Distribution	Percentage (%)
Age (Years)	30-40	10.1
	40-50	32.0
	50-60	35.5
	60-70	29.0

In figure-1 shows gender distribution of the patients where most of the patients were male, 60%. Whereas female were about 40%.The following figure is given below in detail:

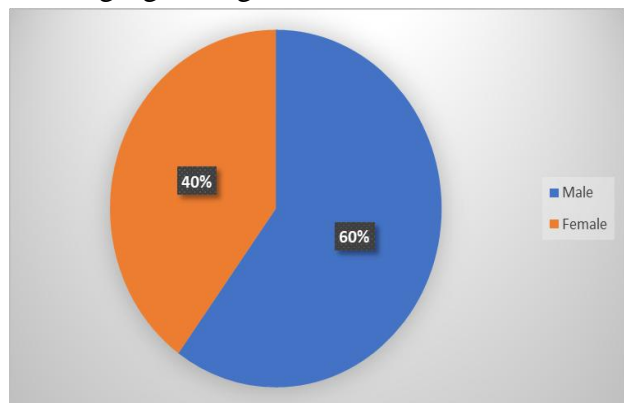


Figure-1: Gender distribution of the patients

In figure -2 shows residential area distribution of the patients where 18% patients belong to urban area. The following figure is given below in detail:

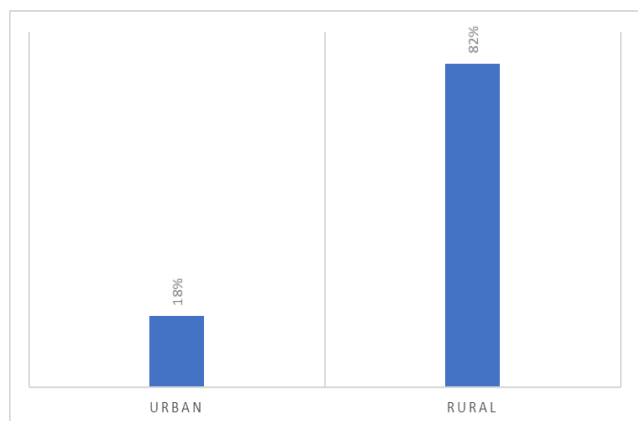


Figure -2: Residential area distribution of the patients

In table-2 shows economic status of patients where 5% were lower class. The following table is given below in detail:

Table-2: Economic status of patients

Economic Status	%
Upper Class	7%
Middle class	34%
Lower class	5%

In table-3 shows clinical characteristics of the patients where in table-1 shows baseline investigations findings of patients where the mean random blood sugar was 11.5±5.5 mg/dl in

patients. The following table is given below in detail:

Table-3: Baseline investigations findings of patients (n=100)

Baseline investigations	Group I (n= 100)
	Mean ± SD
R B S. (mmol/L)	11.5±5.5
S. creatinine (mg/dl)	1.0±0.3
TC (mg/dl)	208.0±48.7
LDL-C (mg/dl)	114.6±23.3

In figure-3 shows symptoms of the peripheral Ulcerative Keratitis where 37% patients had blurred vision, followed by 24% had increased sensitivity to bright light, 39% had a sensation of a foreign object trapped in the eye. The following figure is given below in detail:

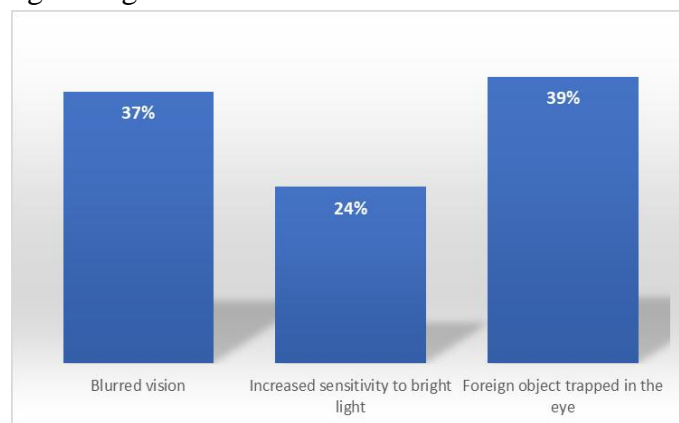


Figure-3: Symptoms of the peripheral Ulcerative Keratitis.

In figure-4 shows common etiology of disease where Mooren’s ulcer present in 32% cases followed by microbiological infection 39% and systemic collagen vascular disease 29%. The following figure is given below in detail:

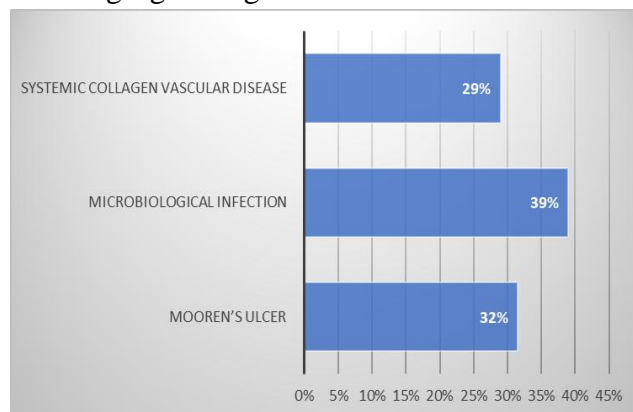


Figure-4: Common etiology of disease

In table-4 shows Visual acuity of patients presenting with PUK where BCVA \geq 6/18 was found in 13 eyes with mild, 7 eyes with moderate and 3eye with severe disease. BCVA <3/60 was

seen in 4 eyes with mild and 5 eyes for moderate disease and 21 eyes with severe disease. The following table is given below in detail:

Table-4: Visual acuity of patients presenting with PUK

Visual acuity	Before treatment Group -1 (n = 75)	After treatment, Group -1 (n = 50)	Before treatment, Group-2 (n = 75)
BCVA \geq 6/18	13	7	3
BCVA <6/18 to \geq 6/60	3	8	2
BCVA <6/60 to \geq 3/6	2	7	13
BCVA <3/60	4	5	21

In table-5 shows management and outcome in patients with PUK where for severe diseases mean time to healing in the cases which were treated

medically was 33.79 \pm 11.68 days. The following table is given below in detail:

Table 5: Management and outcome in patients with PUK

Outcome	Mild diseases	Moderate diseases	Severe diseases
Mean duration of healing (days)	7.88 \pm 2.12	17.38 \pm 5.65	33.79 \pm 11.68
Medical treatment failure	6%	31%	50%
Primary surgical management	0%	0%	45%
Anatomical success	91%	86%	81%
Recurrence	.2%	4%	8%
<u>Visual outcome</u>			
Mean pretreatment BCVA:	0.47 \pm 0.13	0.26 \pm 0.06	0.04 \pm 0.008
Mean post-treatment BCVA:	0.53 \pm 0.21	0.30 \pm 0.11	0.12 \pm 0.04

In table-6 shows comparison of visual outcome in medically versus surgically managed cases where significant visual improvement was noted in severe cases (p=0.001) and all those cases in

which surgery was done after medical failure (p=0.013). The following table is given below in detail:

Table-6: Comparison of visual outcome in medically versus surgically managed cases

Visual acuity	Mean pretreatment BCVA	Mean post-treatment BCVA	p Value
Primary surgical	0.02 \pm 0.03	0.13 \pm 0.04	0.001
Medical followed by surgical treatment	0.11 \pm 0.07	0.20 \pm 0.09	0.0013
Only medically treated cases in severe+moderate cases	0.18 \pm 0.10	0.20 \pm 0.06	0.365

Discussion

The demographic data of our study resembled previously reported studies for patients with PUK in that most patients were 50-60 years.⁶ PUK was more common in men (60%) and was similar to the results of the study carried out by one article.⁷ They also found that, most of the patients were from rural back-ground (66%) and were from low

socioeconomic groups (73%).⁸In our study we found that, 5% were lower class and 82% were from rural.

Most patients (69%) presented to us rather late that is, after 15 days and had severe disease. The mean delay between appearance of symptoms and presentation to hospital was directly related to severity of disease. Significant visual

improvement was noted in severe cases ($p=0.001$) and all those cases in which surgery was done after medical failure ($p=0.013$). Which is quite similar to other studies.⁹⁻¹¹ Number of patients who were on topical corticosteroids along with antibiotics, topical steroids could have suppressed the inflammation so that the patients might have been less symptomatic and thus may have been having irregular follow-up with their treating ophthalmologists.¹²

Conclusion

From our study we can conclude that, that the management of such cases, underscores the need for a detailed workup, regular follow up and specialties. Consultation patients with PUK require thorough ocular and systemic investigations to detect the aetiology on which the treatment is based. Surgical intervention in perforated cases had good visual prognosis and anatomical success. In spite of complete resolution, continued, possibly lifelong is necessary since relapse may occur.

References

1. Robin JB, Schanzlin DJ, Verity SM, et al. Peripheral corneal disorders. *Surv Ophthalmol* 1986;31:1–36.
2. Mortality rate in rheumatoid arthritis patients developing necrotizing scleritis or peripheral ulcerative keratitis. Effects of systemic immunosuppression. Foster CS, Forstot SL, Wilson LA. *Ophthalmology*. 1984 Oct;91(10):1253-63.
3. Mondino BJ. Inflammatory diseases of the peripheral cornea. *Ophthalmology* 1988;95:463–72.
4. Dana M, Qian Y, Hamrah P. Twenty-five-year panorama of corneal immunology: emerging concepts in the immunopathogenesis of microbial keratitis, peripheral ulcerative keratitis, and corneal transplant rejection. *Cornea* 2000;19:625–43.
5. Messmer EM, Foster CS. Vasculitic peripheral ulcerative keratitis. *Surv ophthalmol* 1999;43:379.
6. McKibbin M, Isaacs JD, Morrell AJ. Incidence of corneal melting in association with systemic disease in the Yorkshire Region, 1995–7. *Br J Ophthalmol* 1999; 83:941–3.
7. Sainz de la Maza M, Foster CS, Jabbur NS, et al. Ocular characteristics and disease associations in scleritis-associated peripheral keratopathy. *Arch Ophthalmol* 2002;120:15–19.
8. Srinivasan M, Zegans ME, Zelefsky JR, et al. Clinical characteristics of Mooren's ulcer in South India. *Br J Ophthalmol* 2007;91:570–5.
9. Foster CS, Forstot SL, Wilson LA. Mortality rate in rheumatoid arthritis patients developing necrotizing scleritis or PUK. *Ophthalmology* 1984;91:1253.
10. Watson PG, Hayreh SS. Scleritis and episcleritis. *Br J Ophthalmol* 1976;60:163.
11. Twenty-five-year panorama of corneal immunology: emerging concepts in the immunopathogenesis of microbial keratitis, peripheral ulcerative keratitis, and corneal transplant rejection. Dana MR, Qian Y, Hamrah P. *Cornea*. 2000 Sep; 19(5):625-4
12. Ladas JG, Mondino BJ. Systemic disorders associated with peripheral corneal ulceration. *Curr Opin Ophthalmol* 2000;11:468–71.