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The Management and Outcome of Peripheral Ulcerative Keratitis (PUK) in Bangladesh

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Abstract
Objective: *In this study our main goal is to evaluate the management and outcome of Peripheral ulcerative keratitis (PUK) in Bangladesh.*
Method: *This observational study was done in the in the National Institute of Ophthalmology & Hospital from October 2018 to October 2019. A total of 100 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.*
Results: *during the study, the mean random blood sugar was 11.4±5.4 mg/dl in and 9.1±4.1 mg/dl in patients.35% patients had blurred vision, followed by 25% had increased sensitivity to bright light, 40% had a sensation of a foreign object trapped in the eye. significant visual improvement was noted in severe cases (p=0.001) and all those cases in which surgery was done after medical failure (p=0.012).For severe diseases mean time to healing in the cases which were treated medically was 33.78±11.67 days.*
Conclusion: *From our study we can conclude that, 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, follow-up of cases is necessary since relapse may occur.*
Keywords: *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 cornealstroma associated with an epithelial defect, presence of stromal inflammatory cells and progressive stromal degradation and thinning.[1]

It is a potentially devastating disorder which can present at any age.[2] The unique anatomical and physiological characteristics of peripheral cornea explain its predilection for PUK.[3] It may be the presenting manifestation of a potentially lethal

systemic auto-immune vasculitic disease. 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.[4] However, in patients with an underlying collagen vascular disorder, systemic therapy with immuno-suppressive and immunomodulator agents may decrease the likelihood of ocular morbidity.

In this study our main goal is to evaluate the management and outcome of Peripheral ulcerative keratitis (PUK) in Bangladesh.

Objective

General Objective

- To evaluate management and outcome of Peripheral ulcerative keratitis (PUK) in Bangladesh.

Specific Objectives

- 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	October 2018 to October2019
Study population	100 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 ± 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.

Results

In table-1 shows age distribution of the patients where most of the patients (35.7%) belong 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	10.2
	40-50	31.8
	50-60	35.7
	60-70	28.9

In figure-1 shows gender distribution of the patients where most of the patients were male, 56%. The following figure is given below in detail:

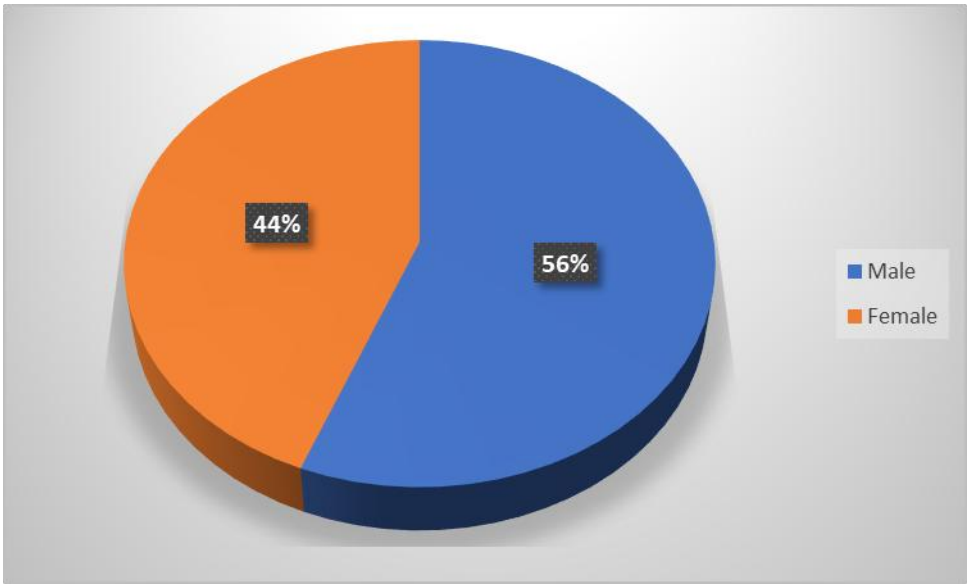

Figure-1: Gender distribution of the patients.

In figure -2 shows residential area distribution of the patients where 20% patients belong to urban area. The following figure is given below in detail:

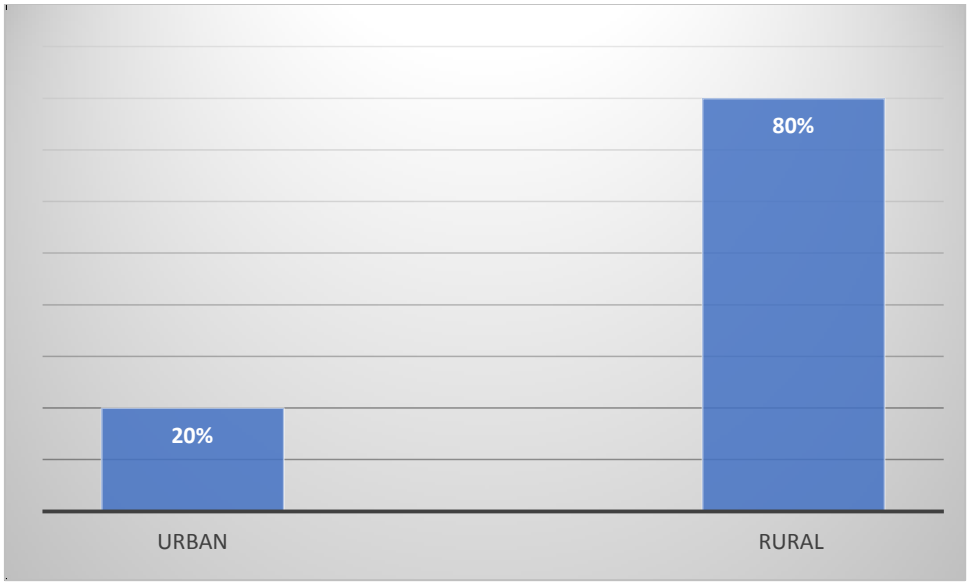

Figure -2: Residential area distribution of the patients

In table-2 shows economic status of patients where 60% were lower class. The following table is given below in detail:

Table-2: Economic status of patients

Economic Status	%
Upper Class	5%
Middle class	35%
Lower class	6%

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 11.4±5.4 mg/dl in and 9.1±4.1 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)	11.4±5.4
S. creatinine (mg/dl)	1.0±0.2
TC (mg/dl)	209.0±48.6
LDL-C (mg/dl)	114.5±23.2

In figure-3 shows symptoms of the peripheral Ulcerative Keratitis where 35% patients had blurred vision, followed by 25% had increased sensitivity to bright light, 40% had a sensation of a foreign object trapped in the eye. The following figure is given below in detail:

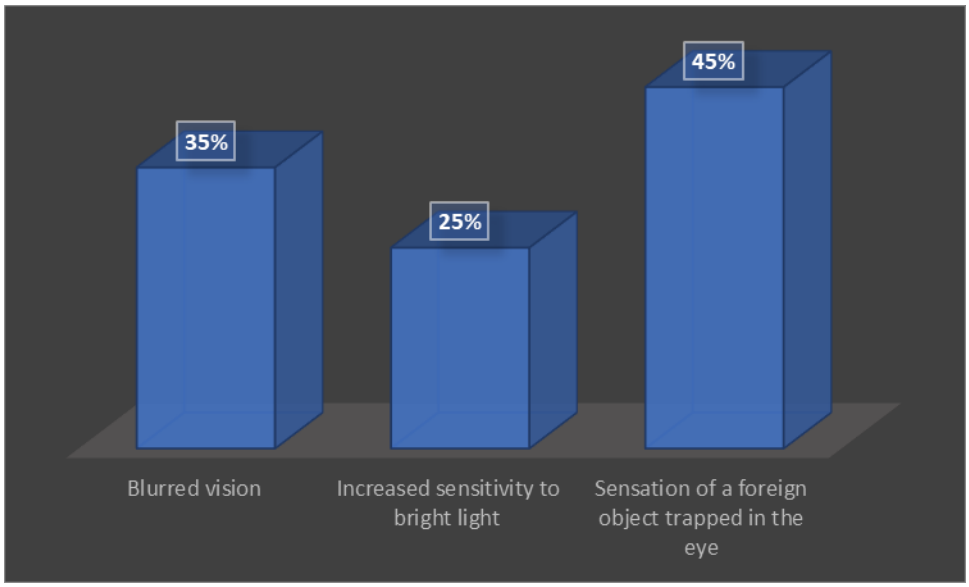

Figure-3: Symptoms of the peripheral Ulcerative Keratitis.

In figure-4 shows common etiology of disease where Mooren's ulcer present in 31.5% cases followed by microbiological infection 40% and systemic collagen vascular disease 28.5%.The following figure is given below in detail:

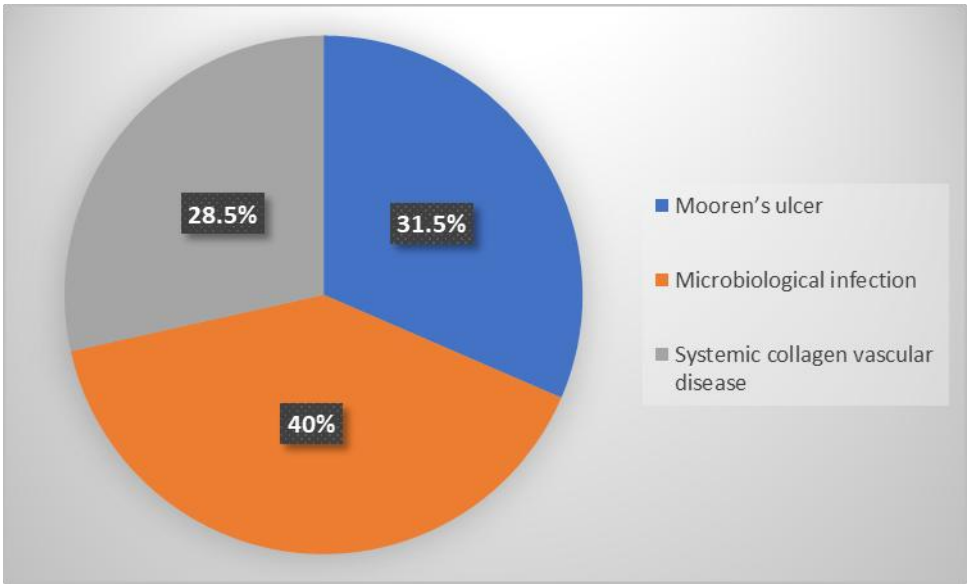

Figure-4: Common etiology of disease

In table-4 shows Visual acuity of patients presenting with PUK where BCVA≥6/18 was found in 14eyes with mild, 8 eyes with moderate and 1 eye with severe disease. BCVA <3/60 was seen in 3eyes with mild and moderate disease and 20 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 = 50)	After treatment, Group -1 (n = 50)	Before treatment, Group-2 (n = 50)
BCVA≥6/18	14	8	1
BCVA <6/18 to≥6/60	2	7	3
BCVA <6/60 to≥3/6	1	6	12
BCVA <3/60	3	3	20

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 33.78±11.67 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)	7.87±2.13	17.37±5.63	33.78±11.67
Medical treatment failure	5%	30%	51%
Primary surgical management	0%	0%	49%
Anatomical success	90%	85%	80%
Recurrence	.1%	5%	9%
Visual outcome Mean pretreatment BCVA: Mean post-treatment BCVA:	 0.46±0.12 0.52±0.20	 0.25±0.05 0.29±0.11	 0.03±0.005 0.11±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=0.012). 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±0.01	0.13±0.04	0.001
Medical followed by surgical treatment	0.11±0.07	0.20±0.09	0.0012
Only medically treated cases insevere+moderate cases	0.18±0.10	0.20±0.06	0.364

Discussion

The demographic data of our study resembled previously reported studies for patients with PUK in that most patients were 50-60 years.[5] PUK was more common in men (56%) 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%).[8] In our study we found that, 60% were lower class and 80% were from rural.

In one study they reported that, of the 65 patients in our study, 24(31.5%) were tobacco smokers. [9]In our series, there was less number of bilateral cases. [9]

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=0.012). Which is quite similar to other study.[9] 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.[10]

Conclusion

From our study we can conclude that, 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, follow-up of cases is necessary since relapse may occur.

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