

## PRACTISE AND USE OF OVER-THE-COUNTER TOPICAL AND TRADITIONAL EYE MEDICINES AND THEIR EFFECTS IN FUNGAL KERATITIS CASES IN TERTIARY TEACHING HOSPITAL IN NORTHERN INDIA

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### ABSTRACT

**Objective:** The study goal is to evaluate the utilization and misuse of over-the-counter topical and traditional eye medications and their associated adverse effects in cases of fungal keratitis (FK) among patients.

**Methods:** The research was conducted in the past 36 months at a tertiary teaching hospital in Northern India. All subjects provided informed consent, and the institutional ethical committee granted ethical approval. The study involved 127 cases of FK, clinically diagnosed and confirmed by a 10% KOH mount.

**Results:** Among the baseline characteristics, 51 (40.18%) of the samples were in a 41–60-year-old age group; 78 (61.42%) were male; 116 (91.34%) were from rural areas; 114 (89.76%) had low socioeconomic status; 108 (85.4%) were illiterate; and 50 (39.37%) were farmers. According to visual acuity ratings, at the time of presentation, 57.48% of the patients had vision up to 1/60. In terms of over-the-counter medication usage, 109 (85.82%) respondents used them for the treatment of keratitis, with 64 (61.46%) using steroid drops. In the case of traditional eye medicines, 18 (14.18%) respondents used them, with 5 (27.11%) using milk and ghee.

**Conclusion:** This study underscores the importance of addressing the misuse of over-the-counter and traditional eye medications in cases of FK and advocating for public health interventions to ensure rational and safe eye medication practices.

**Keywords:** Eye medicine, Fungal keratitis, Over the counter.

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### INTRODUCTION

The human eye is often regarded as one of the most esthetically pleasing features in existence. The ability to fully appreciate beauty is contingent upon the unimpaired functionality of the human visual system. It is well acknowledged that vision exerts influence on cognitive processes. The human tendency is to place trust in visual evidence and to have a preference for seeing information that aligns with preexisting beliefs. The eye is a vulnerable organ that is safeguarded against diseases and dangerous microorganisms by its inherent defensive mechanisms. The presence of this inherent mechanism for regulation is crucial to maintaining optimal ocular health. Disruption of the intricate equilibrium of the safeguarding environment may result in the development of ocular disorders that cause vision impairment.

The cornea serves as the primary refractive and protective layer of the eye. Keratitis is a medical term used to describe the inflammation of the cornea. Keratitis may arise from several etiologies, including viral, physical, or chemical factors. Infectious or microbial keratitis is indicative of overall health status since it has a greater prevalence within the population and is linked to various consequences. The diverse manifestations, overlapping clinical features, and fast course of microbial keratitis have been a persistent problem for medical practitioners. Bacterial keratitis has the highest prevalence among cases of microbial keratitis. However, there has been a consistent rise in the incidence of fungal keratitis (FK) in recent years, which may be attributed to a combination of other contributing factors. Although FK is

slower compared to bacterial keratitis, it nevertheless causes significant ocular morbidity. FK poses a substantial danger in poor nations and is among the primary contributors to visual impairment [1].

Keratitis refers to a collection of inflammatory illnesses, both acute and chronic, that manifest in the cornea as a result of several events that impair the protective mechanism of the eye's outer layer. The inflammation may arise from several sources, including allergic (reactive), physical, chemical, or infective (parasites, bacteria, fungus, and viruses) origins. Infectious or microbial keratitis, a very consequential ocular condition, has been well recognized as a prominent contributor to vision impairment and avoidable blindness on a global scale. In a commendable manner, the World Health Organization has duly classified infectious keratitis as one of the most neglected tropical illnesses. Microbial keratitis poses a diagnostic challenge for clinicians due to its ambiguous signs and symptoms, as well as its rapid advancement [2].

Corneal infections leading to blindness are a significant concern, alongside cataracts, and fungal infections of the cornea have emerged as a prominent ocular illness on a worldwide scale. Fungal corneal infections are quite prevalent in India, accounting for a significant proportion of culture-positive cases, estimated to be at least 50%. Nevertheless, the prevalence rate exhibits variability between different countries as well as across different populations within the same nation [3].

The occurrence rate and distribution patterns of FK exhibit a significant correlation with geographic locations, displaying considerable variation

around the globe. This variation is seen not only across various areas within a nation but also within distinct groups of people. FK is receiving growing recognition on a global scale, especially in developing nations and regions characterized by tropical and subtropical climates. These areas account for roughly half of all reported occurrences of FK worldwide. Consequently, the significance of FK as a leading cause of visual impairment cannot be disregarded [4].

FK is associated with a set of distinct clinical signs; however, these findings lack the specificity required for a definitive diagnosis and may resemble symptoms of bacterial or parasitic keratitis. Hence, due to the lack of laboratory-based diagnostic methods, a significant proportion of patients may need empirical treatment, leading to unfavorable outcomes that have the potential to advance to endophthalmitis, especially if not promptly addressed. The presence of newly identified fungal infections and the development of resistance to currently available antifungal medications have exacerbated the unfavorable prognosis associated with FK [5].

The FK pharmacological management mostly relies on the usage of topical antifungal medicines. At present, there is a lack of precise antifungal advice corresponding to the isolation of certain fungal strains. There exists variability among these antifungal agents with regard to their corneal penetration capabilities and efficacy. The administration of antimicrobial pharmacological drugs by topical instillation continues to be widely regarded as the preferred and most effective treatment technique. There exists a divergence of opinions on the efficacy of intrastromal injections, although empirical evidence has yet to substantiate any discernible advantages over the conventional method of topical instillation [6]. The study goal is to evaluate the utilization and misuse of over-the-counter topical and traditional eye medications and their associated adverse effects in cases of FK among patients.

## METHODS

This study aims to assess the utilization and misuse of over-the-counter topical and traditional eye medications, as well as their associated adverse effects, in cases of FK. The study will focus on patients attending the outpatient department and those admitted to the Tertiary Care Hospital in North-Central India. The study design will be observational and cross-sectional in nature. The research was conducted at a tertiary care hospital in the past 36 months. The informed permission of all participants has been obtained, and a research was conducted in accordance with ethical norms and principles, ensuring the protection of their privacy and confidentiality. Before the implementation of the research process, approval was obtained from the institutional ethical committee. A research comprised 127 instances of FK that were clinically diagnosed and verified by a 10% KOH mount, exhibiting typical characteristics.

### Statistical analysis

A Microsoft® Excel spreadsheet (version 2019) was used to record and compile the data, and SPSS (SPSS 21.0, IBM, Armonk, NY, USA) was used for statistical analysis. Frequency and percentage were used to express categorical data. The mean and standard deviation were used to express quantitative data.  $p < 0.05$  was statistically significant.

## RESULTS

### Baseline characteristics

Table 1 depicts that 51 (40.18%) of the samples were 41–60 years of age, 78 (61.42%) were male, 116 (91.34%) of the respondents from were rural areas, 114 (89.76%) were from low socioeconomic status, 108 (85.4%) respondents were illiterate, and 50 (39.37%) were farmers.

### Visual acuity score

In Table 2, 57.48% of patients had vision up to 1/60 at the time of presentation. 25% of patients had visual acuity  $>1/60-6/60$ , 20% had visual acuity up to  $>6/60-6/18$ , and 7.87% had  $>6/18$ .

**Table 1: Distribution of demographic variables**

Demographic variables	Frequency	Percentage
Age group		
<20 years	10	07.87
21–40 years	33	25.98
41–60 years	51	40.18
61–80 years	31	24.40
>80 years	02	01.57
Sex		
Male	78	61.42
Female	49	38.58
Area		
Urban	11	8.66
Rural	116	91.34
Socioeconomic Status		
Low	114	89.76
Middle	12	9.44
High	01	0.80
Literacy		
Illiterate	108	85.4
Literate	19	14.96
Occupation Wise Distribution		
Framers	50	39.37
Laborers	40	31.50
Housewives	19	14.96
Drivers	2	1.57
Others	16	12.60

**Table 2: Visual acuity score**

S. No.	Visual acuity score	Frequency	Percentage
1.	Up to 1/60	73	57.48
2.	$>1/60-6/60$	25	19.69
3.	$>6/60-6/18$	20	15.74
4.	$>6/18$	10	7.87

## DISCUSSION

In this study, final visual acuity up to 6/60 was observed in 77.38% of patients over 40, 82.22% of patients whose day of presentation was longer than 7 days, 90.63% of patients using topical steroid, 87.76% of patients with central ulcers, 80.00% of patients using TEM, 89.19% of patients with hypopyon, and 74.36% of patients with septate fungal infection. In contrast to other factors, TEM usage and septate fungal infection were not statistically significant. Two individuals who were younger than a year old did not have their factors evaluated; therefore, their visual acuity was not noted (Tables 1-3).

109 (85.82%) respondents were using over-the-counter medications for the treatment of keratitis, and 18 (14.18%) were using traditional eye medicines (Table 4).

In over-the-counter medications, 64 (61.46%) respondents used steroid drops, followed by 21 (19.26%) using antibiotic eye drops, 15 (13.76%) using antiallergic eye drops, and 6 (5.50%) using lubricating eye drops (Table 5).

In traditional eye medicines, 5 (27.11%) respondents used milk and ghee, respectively, followed by 4 (22.22%) using coconut oil and 2 (11.11%) using honey and flower juice, respectively (Table 6).

The study by the authors aimed to assess the use and misuse of over-the-counter topical and traditional eye medications, as well as their associated adverse effects, in cases of FK. The study discovered that most of the patients had poor visual acuity at presentation and that various factors, such as age, duration of symptoms, usage of steroids, location of ulcer, presence of hypopyon, and type of fungal infection, were associated with worse visual outcomes. The study also found that a high proportion of patients used over-the-counter medications,

Table 3: Factors affecting visual outcome

S. No.	Factors	Final visual acuity				p value
		Up to 6/60		> 6/60		
		n	%	n	%	
1.	Age					
	Up to 40 years	41	53.66	19	46.34	p<0.05
	>40 years	84	77.38	19	22.62	
2.	Day of presentation					
	Up to 7 days	35	37.14	22	62.86	p<0.05
	>7 days	90	82.22	16	17.78	
Steroid drops instillation						
3.	Yes	32	90.63	3	9.37	p<0.05
	No	93	62.37	35	37.63	
4.	TEM use					
	Yes	15	80	3	20	p=0.526
	No	110	68.18	35	31.82	
5.	Ulcer location					
	Central	98	87.76	12	12.24	p<0.05
	Peripheral	27	3.70	26	96.30	
6.	Hypopyon					
	Yes	37	89.19	4	10.81	p<0.05
	No	88	61.36	34	38.64	
7.	KOH picture					
	Septate	78	74.36	20	25.64	p=0.241
	Aseptate	39	64.10	14	35.90	
	Yeast	8	50	4	50	

Table 4: Distribution of samples according to use of over the counter medication, traditional eye medicine

	Frequency	Percentage
Over the counter medications	109	85.82
Traditional Eye Medicines	18	14.18

Table 5: Distribution of samples according to over the counter medications

Over the counter Medication	Frequency	Percentage
Steroid drops	67	61.46
Antibiotic eye drops	21	19.26
Antiallergic eye drops	15	13.76
Lubricating eye drops	06	5.50

Table 6: Distribution of samples according to use of traditional eye medicines

Traditional eye medicines	Frequency	Percentage
Milk	5	27.77
Honey	2	11.11
Ghee	5	27.77
Coconut oil	4	22.22
Flower Juice	2	11.11

especially steroids, and traditional eye medicines, such as milk, ghee, coconut oil, honey, and flower juice, for FK treatment. The study highlighted the need for public awareness and education about FK prevention and management, as well as the regulation and rational use of over-the-counter eye medications.

The investigation's results are in line with earlier studies conducted in India and other developing nations, where FK is a common and serious eye illness that can cause blindness [7-9]. The research has identified the risk factors for FK, which include immunosuppression, ocular surface illness, contact lens use, and ocular trauma [10-12]. It's less evident, though, how conventional and over-the-counter topical treatments

relate to FK. These drugs may exacerbate the infection, postpone the identification and treatment of FK, or have unfavorable side effects such as corneal toxicity, allergies, or superinfection, according to certain research [13-15]. These drugs may have some positive effects, such as lowering pain, inflammation, or bacterial co-infection, according to other research [16-18]. To ascertain the safety and effectiveness of these drugs in treating FK, further study is therefore required.

The authors' study is subject to certain limitations, containing a retrospective design, absence of a control group, small sample size, and potential selection bias. Thus, it's possible that the findings cannot be applied to different populations or environments. Furthermore, the results of FK were not evaluated in connection with the kind, quantity, frequency, or origin of over-the-counter eye medicines that the patients took. Therefore, it is necessary to conduct more prospective research with bigger sample sizes and more thorough data gathering to investigate these issues. Furthermore, qualitative research may be helpful in figuring out the patients' motivations and worldviews for utilizing and misusing these drugs.

In conclusion, the research conducted by the authors offers a significant understanding of the occurrence, manifestation, management, and consequences of FK in an Indian tertiary care facility. The study also highlights the question of traditional and over-the-counter topical treatments for FK, which may have beneficial or detrimental effects on the illness. The study emphasizes the necessity of public health initiatives to promote responsible use of eye medicines and prevent FK.

## CONCLUSION

This research highlights the misuse of over-the-counter and traditional eye medications. A significant number of patients (85%) with FK were found to have used these treatments initially. Steroid drops were commonly used as the primary treatment, which can be problematic.

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**CONFLICT OF INTEREST**

None.

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**AUTHOR CONTRIBUTION**

Author KBR conceived the present idea, designed the protocol, and analyzed the data. The author KD, designed the protocol and reviewed the manuscript. Author GP helped in manuscript drafting and proofreading.

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