

Prevalence of Trachoma in Gilgit, Pakistan: A Cross-Sectional Study at Tertiary Care Center (2018-2023)

Qaim Ali Khan¹, Muhammad Tahir², Yasir Iqbal³, Nauroz Fatima¹, Qurat ul Ain Ghazanfar⁴, Benish Ali⁴

Abstract:

Objective: To assess the prevalence of trachoma among patients attending a tertiary care hospital in Gilgit, Pakistan.

Methods: Data for this descriptive cross-sectional study was collected by consecutive sampling from analyzing the medical records of all the patients presenting to the Gilgit Eye Care Centre during the spanning from January 2018 to January 2023 (a 5-year period) ensuring that diagnosis of trachoma was based upon the WHO criteria (FISTO). The data was analyzed according to gender and age on SPSS and results were compiled.

Results: A total of 24,589 patients were examined during the study period consisting of 61.8% females and 38.2% males. The estimated prevalence of trachoma was 0.22% (95% confidence interval: 0.14% - 0.30%). Among them, 54 were diagnosed with active trachoma, with mean age 23.30, SD 14.32 years with a female to male ratio of approximately 4.26:1 (81% females, 19% males).

Conclusion: This pilot study identified prevalence of trachoma in a hospital setting, highlighting the need for population-based studies to assess the true disease burden in Gilgit. *Al-Shifa Journal of Ophthalmology* 2024; 20(1): 27-32. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

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1. Azad Jamu Kashmir Medical College, Muzaffarabad.
 2. Combined Military Hospital, Mardan.
 3. Watim Medical College, Rawat Rawalpindi.
 4. Combined Military Hospital, Muzaffarabad.
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Correspondence to:

Yasir Iqbal
Watim Medical College, Rawat
Rawalpindi.
yazeriqbal@gmail.com

Introduction:

Trachoma, a neglected tropical disease caused by the bacterium *Chlamydia trachomatis*, casts a long shadow on global public health. It remains the leading infectious cause of blindness worldwide, disproportionately impacting low-resource communities.¹ An estimated 1.9 million people globally suffer from vision impairment or blindness due to trachoma², highlighting the devastating consequences of this chronic eye infection. While most infected individuals experience no initial symptoms, repeated infections over extended periods can lead to a progressive and debilitating disease.³ Untreated trachoma progresses through stages, culminating in trichiasis, a condition where the eyelashes turn inward and scrape against the cornea, causing excruciating pain, corneal scarring, and ultimately, irreversible blindness.⁴

Trachoma remains a significant public health concern across 42 countries.⁵ However, stories of success offer hope. Several nations, including Pakistan, have made remarkable strides in tackling the disease. Supported by the World Health Organization's (WHO) initiative, the Global Elimination of Blinding Trachoma by 2020 (GET 2020) program, Pakistan implemented the SAFE strategy (Surgery, Antibiotics, Facial cleanliness, Environmental improvement) with significant impact.⁶ This strategy led to a dramatic decrease in active trachoma cases and trichomatous trichiasis, particularly in upper Sindh.⁷ While the initial GET 2020 target of global elimination by 2020 was not met, significant progress has been made. Africa, once the most affected continent, has witnessed a 90% reduction in trachoma cases.⁸ Renewed global efforts, with a target of elimination by 2030, offer a glimmer of hope for a trachoma-free future. Despite these successes, challenges remain. Population displacement and migration patterns can reintroduce trachoma into previously controlled areas.⁹ Furthermore, achieving complete national elimination requires sustained commitment and a well-coordinated national trachoma plan to reach all at-risk populations.¹⁰

Pakistan's progress in tackling trachoma serves as a testament to the effectiveness of the SAFE strategy and unwavering commitment.¹¹ However, achieving complete national elimination necessitates continued vigilance. Study⁶ across various districts, including D.G. Khan (Punjab), Chitral (Khyber Pakhtunkhwa), and Shahdadkot (Sindh), have documented the presence of trachoma, highlighting the need for geographically specific data to guide targeted interventions. Estimates suggest that roughly 0.81 million people in Pakistan still suffer from trachoma, underlining the importance of ongoing efforts to eliminate this disease.¹²

This pilot study aimed to obtain a preliminary assessment of trachoma prevalence in Gilgit, Pakistan, by

determining the prevalence of trachoma among patients attending a tertiary care hospital in Gilgit. This can serve to evaluate the potential risk in this specific population and set a path for targeted interventions for trachoma elimination.

Materials and Methods:

This descriptive cross-sectional study aimed to determine the prevalence of trachoma in patients presenting to a tertiary care hospital in Gilgit, Pakistan. Following ethical approval from the Gilgit Eye Care Centre's ethical committee, analysis of medical records from January 2018 to January 2023 was conducted using nonprobability consecutive sampling method. Medical records of all patients presenting during this period were reviewed. Patients of all ages were included if their diagnosis aligned with the WHO trachoma classification (follicles [F], inflammation-intense [I], scarring [S], trichiasis [T], opacity [o]). Exclusion criteria encompassed corneal opacities, trichiasis, follicles, or opacities attributable to other ocular diseases. The data was entered on SPSS version 21 for analysis. Descriptive data were presented as frequencies while numerical data as means and standard deviations.

Results:

A cross-sectional study examined a total of 24,589 patients consisting of 61.8% females and 38.2% males. Among them, 54 were diagnosed with active trachoma, with ages ranging from 3 to 70 years (mean 23.30, SD 14.32 years). The estimated prevalence of trachoma was 0.22% (95% confidence interval: 0.14% - 0.30%). Reflecting the female predominance in the overall population, trachoma diagnosis exhibited a female to male ratio of approximately 4.26:1 (81% females, 19% males). The data on active trachoma prevalence by age and sex revealed a distinct distribution. While the overall population leaned female, the analysis of active trachoma cases revealed a surprising

trend. Contrary to the initial statement about a female predominance, the data in the table I shows the highest prevalence (around 33%) in female children under 10 years old. This rate was nearly double that observed in males of the same age group (around 15%). Notably, the prevalence steadily declined with increasing age, with patients over 30 years old demonstrating a significantly lower prevalence (around 7%). In contrast to active trachoma, trachomatous trichiasis (TT) manifested primarily in adults, as expected. Table II highlights the distribution within the 54

active trachoma cases. Interestingly, no cases of TT were identified in children under 10 years old. The first appearance occurs in the 10–15-year age group, affecting only females (1.85%). This pattern continues into the 16–30-year age group, with a low prevalence (3.7%) equally distributed between sexes. A dramatic rise in TT prevalence is observed in those exceeding 30 years old, reaching a very high value (almost 95%) in the table. Here, females are significantly more affected (over 50%) compared to males (around 7%).

Table 1: Active Trachoma Prevalence by Age and Sex

Age group (years)	Male (%)	Female (%)	Total (%)
1-9	15.75	33.21	48.96
10-15	11.84	19.1	30.94
16-30	3.45	9.48	12.93
>30	1.49	5.69	7.18
Total	32.53	67.47	100

(n=54)

Table 2: Trachomatous Trichiasis Prevalence by Age and Sex

Age Group (years)	Male (%)	Female (%)	Total (%)
1-9	0	0	0
10-15	0	1.85	1.85
16-30	1.85	1.85	3.7
>30	7.4	51.8	94.45
Total	9.25	55.5	100

(n=54)

Discussion:

We estimated a prevalence of active trachoma of 0.22% among the patients in our study. While this represents a relatively low overall burden, a closer look at the data reveals concerning trends regarding age and sex distribution. The study identified the highest prevalence of active trachoma (around 33%) in females under 10 years

old. This finding is surprising as some previous research suggests a higher prevalence in females of reproductive age.¹³ Studies conducted in Ethiopia, for instance, documented a higher burden among women aged 1-9 years compared to younger children.¹⁴ One possible explanation for the observed discrepancy in could be differences in hygiene practices

between younger and older girls. Further research is needed to explore the specific factors contributing to the high prevalence in this age group.

The study also found a steady decline in active trachoma prevalence with increasing age. This aligns with observations from other studies¹⁵, suggesting a potential link between repeated exposure and the development of the more severe stage, trachomatous trichiasis (TT). The absence of TT cases in children under 10 further supports this notion, as TT typically develops over years of chronic infection.

The dramatic rise in TT prevalence observed in those exceeding 30 years old (almost 95%) underscores the long-term consequences of untreated trachoma. This finding is consistent with global data highlighting the disproportionate burden of TT in adults, particularly females.¹⁶

The female predominance in trachoma diagnosis (around 4.26:1) aligns with previous research.¹⁷ Factors such as close contact with young children, who may be asymptomatic carriers, and increased caregiving responsibilities could contribute to this disparity.¹⁸ However, the reasons behind the higher prevalence of TT in females over 30 require further investigation.

Several factors are believed to contribute to trachoma infection. Studies suggest that the presence of facial flies, large family size, ocular discharge, nasal discharge, and low socioeconomic status all increase the risk of trachoma.¹⁹ Living in high-altitude regions with unsafe water sources is also considered a risk factor. Open defecation is widely recognized as a major risk factor for trachoma transmission.¹⁹ However, some studies suggest that simply having access to a latrine might not be enough.¹⁷ Latrine use is crucial and research indicates that a significant portion of the population may not be using available facilities. Conversely, several practices can help prevent trachoma infection i.e. regularly washing children's faces and clean environment and hygienic waste disposal.²⁰

This study offers valuable insight into understanding trachoma in Gilgit. A key strength is the utilization of a standard clinical examination and WHO criteria for diagnosing trachoma. This approach ensures the accuracy and generalizability of the findings within the context of established practices.

This study has several limitations. Firstly, the cross-sectional hospital-based design limits the generalizability of the findings to the entire population of Gilgit. People with existing eye complaints are more likely to seek care at a hospital, potentially biasing the sample towards a higher prevalence than what exists in the general population. Additionally, the study did not investigate the reasons behind the observed higher prevalence in young females. Furthermore, seasonal variations in trachoma prevalence were not considered. Confounding factors such as access to clean water and sanitation, along with socioeconomic status, were not addressed in this study. Obtaining information on these factors through surveys and questionnaires could provide valuable insights into potential risk factors for trachoma.

Despite these limitations, our study indicated the tip of the ice burg and necessitates further investigation for trachoma prevalence in the region. Larger-scale, population-based studies with prospective survey-based clinical examinations are needed to confirm our findings and establish the true regional burden of trachoma. Additionally, employing advanced diagnostic tools like PCR tests could provide a more comprehensive picture of active infections. Furthermore, exploring alternative treatment options and the effectiveness of community-based interventions alongside antibiotics could offer valuable insights for optimizing trachoma control strategies in Gilgit and Pakistan as a whole.

Conclusion:

This pilot study identified prevalence of trachoma in a hospital setting, highlighting

the need for population-based studies to assess the true disease burden in Gilgit.

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Authors Contribution

Concept and Design: Qaim Ali Khan
Data Collection / Assembly: Muhammad Tahir, Nauroz Fatima
Drafting: Qurat ul Ain Ghazanfar
Statistical expertise: Benish Ali
Critical Revision: Yasir Iqbal