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# Clinical and Demographic Profile of Penetrating Keratoplasty in Kashmir

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**Abstract**
**Purpose:** *To evaluate the patients undergoing keratoplasty in Kashmir in terms of diagnosis, age, gender, the operated eye, geographic distribution of patients and indications for surgery*
**Methodology:** *This was a cross-sectional hospital based study carried out on 112 patients who underwent keratoplasty from July 2017 to October 2018 in the department of Ophthalmology at SMHS Hospital GMC Srinagar, Jammu and Kashmir.*
**Results:** *A total of 112 penetrating keratoplasties were performed. Out of which 54.46% were males and 45.53% were females. The age of the patients ranged from 17 year to 90 year with mean age of 53.5 years. Among all the corneal disease pseudophakic bullous keratopathy (39.28%) was the leading indication for penetrating keratoplasty followed by corneal opacity (37.5%), corneal dystrophy(7.14%), keratoconus (5.36%),(4.5%),corneal degeneration (3.71%),and perforated corneal ulcer (2.7%)*
**Conclusion:** *Contrary to other studies carried elsewhere in India, where Healed keratitis forms the bulk. Our observation has been about Pseudophakic Bullous Keratopathy being the frontrunner as an indication for keratoplasty in our center. This trend in our study is due to increase in Cataract surgery with intraocular lens implantation in outreach mass camps.*

## Introduction

The Cornea is a tissue in the human eye that has a purpose of improving the quality of the image formed in the retina. It is a convex, transparent, intensely innervated and sensitive membrane and is the only a vascular tissue in the human body.[1-2] Corneal disease is one of the leading causes of visual impairment and blindness worldwide with the majority of these people residing in the developing country[3]. Blindness is a common problem all over the world and WHO estimates 45 million people are blind in the world who are bilaterally blind, of which 6 to 8 million are blind due to corneal diseases.[4]

According to the National Programme for Control of Blindness estimates in India, it is estimated that there are approximately 6.8 million people who have vision less than 6/60 in at least one eye due to corneal diseases; of these about a million have bilateral involvement.[5,6] Keratoplasty is the procedure of choice to rehabilitate the patients with corneal blindness. But unfortunately corneal transplantation is not obtained by the majority of the population in need worldwide, there is an estimated 12.7 million people in need of corneal transplantation. Keratoplasty is defined as surgical replacement of the host cornea with that of a donor one

Can be either:
Full thickness (Penetrating keratoplasty)
OR
Partial thickness (lamellar keratoplasty)
Various indications for Keratoplasty include[7];

1) Optical:
   a) Aphakic/Pseudophakic Bullous Keratopathy
   b) Keratoconus
   c) Corneal scars/adherent leucomas
   d) Corneal dystrophies/degeneration
   e) Regrafts
2) Theurapeutic
3) Tectonic
4) Cosmetic

The idea of replacement of a diseased cornea dates back to eighteenth century and is credited to Frenchman named GP De Quengsy.
In 1838, Kissam performed a "Xenograft".[8] Zirm however is the first surgeon to have performed a successful human corneal transplant in 1905 in Eastern Europe.
Corneal transplantation remains the most common tissue transplantation performed worldwide. Avascularity and immunologic privilege of the cornea allow greater success rates of corneal transplants in comparison with other organ transplantation[9] making it the most successful transplant procedure in the field of medicine

**Materials and Methods**

This study is a cross-sectional hospital based study carried out on 112 patients who underwent corneal transplantation from July 2017 to October 2018 in the department of Ophthalmology SMHS Hospital, GMC Srinagar, Jammu and Kashmir for a period of one year and three month
The analyzed variables were age, gender, the operated eye, geographic distribution of patients and indications for Surgery.
The research protocol has been cleared by the research ethics committee and is in accordance with the Helsinki Declaration.

**Results**

A total of 112 patients underwent penetrating keratoplasty during this study period. Out of 112 patients, 61 (54.46%) were male and 51 (45.53%) were females. The age ranged from 17 years to 90 years with the mean of 53.5%. Maximum number of cases were from > 61 years.

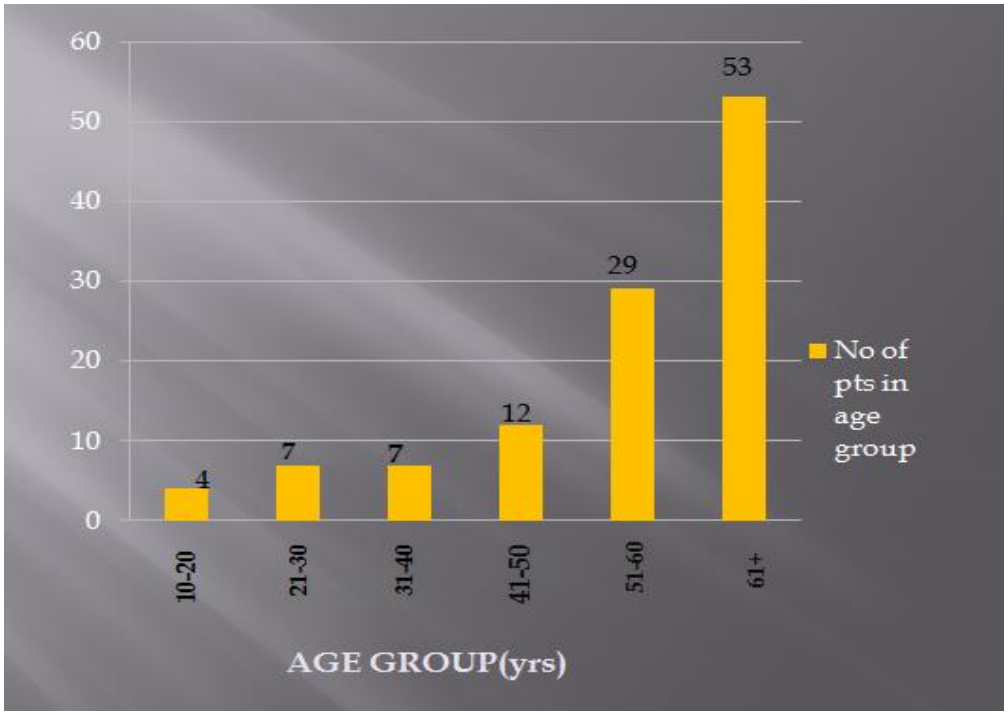



**Figure 1** Age-wise distribution

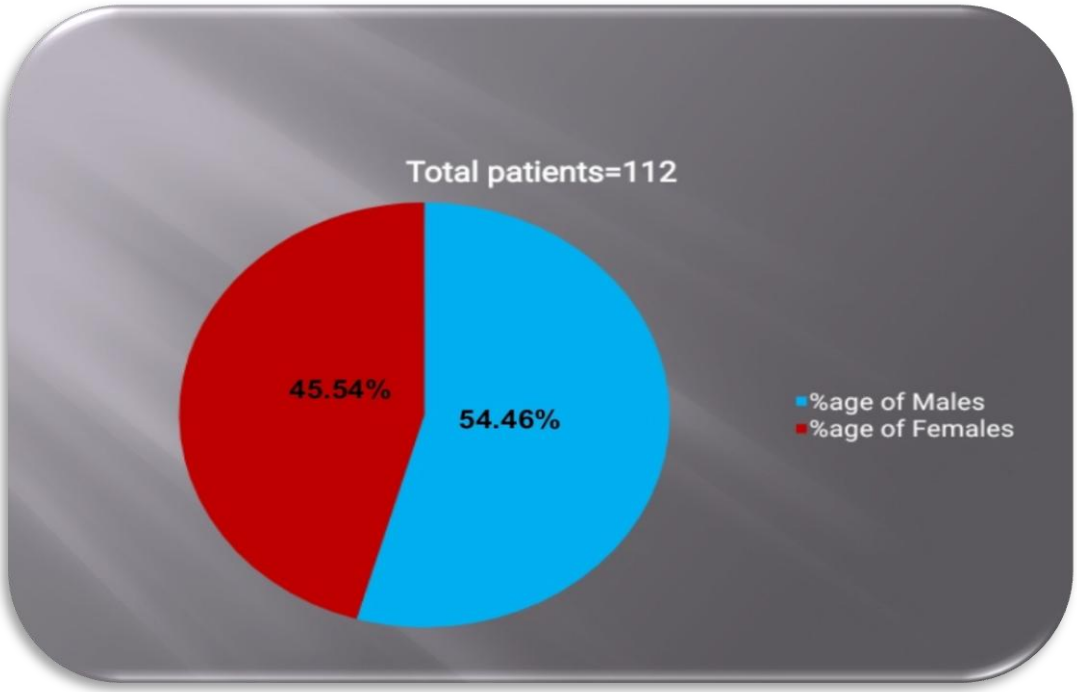



**Figure 2:** Gender wise distribution of variables

**Figure 3:** Indications of keratoplasty

| Diagnosis | No.of cases | Percentage |
|---|---|---|
| Pseudophakic bullous keratopathy | 44 | 39.28% |
| Corneal Opacity | 42 | 37.5% |
| Corneal Dystrophy | 8 | 7.14% |
| keratoconus | 6 | 5.36% |
| Failed Graft | 5 | 4.5% |
| Corneal Degeneration | 4 | 3.6% |
| Perforated Corneal Ulcer | 3 | 2.75 |

Most common indication of keratoplasty in our study was Pseudophakic bullous keratopathy which contributes for 44(39.2%) cases of penetrating keratoplasty followed by Corneal Opacity 42 cases(37.5%)

**Figure 4:** Distribution of Patients as per eye involved

| EYE | | % age | |
|---|---|---|---|
| Right | Left | Right | Left |
| 57 | 55 | 51 | 49 |

**Figure 5:** Geographic distribution of corneal transplant performed in Jammu and Kashmir from July 2017 to October 2018

| NORTH | CENTRAL | SOUTH | OUTSIDE KASHMIR |
|---|---|---|---|
| 43 | 32 | 29 | 8 |

Figure 5: Shows the geographic distribution of corneal transplants in the state of Jammu and Kashmir .Of the total 112 Corneal transplants, 43 were done in patients residing in the northern part of Kashmir, 32 were performed in patients residing in central Kashmir,29 corneal transplant were performed in patients residing in southern part of Kashmir and 8 patients were performed in patients residing outside the Kashmir. After analyzing the cases by place of residence of the patient, it was observed that majority of the cases came from northern part of Jammu and Kashmir

**Figure 6:** Distribution of study population according to eye involved

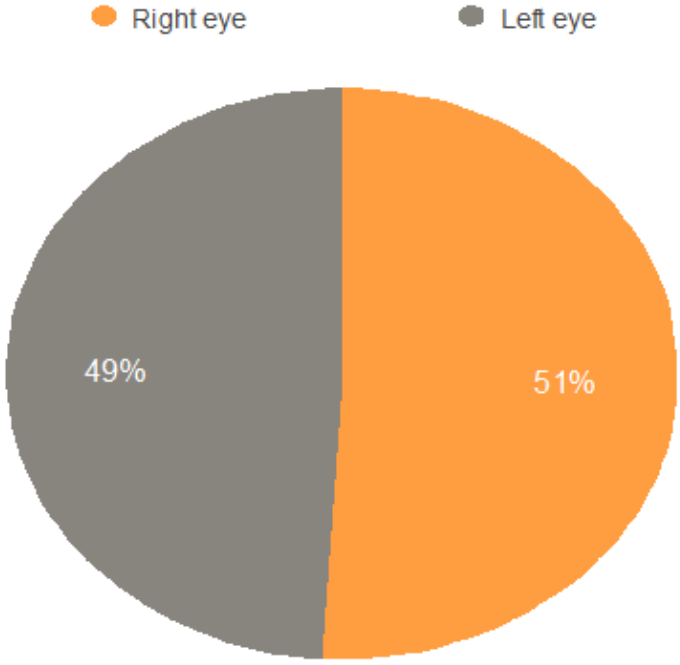



Figure 6: shows the distribution of study population according to eye involved.

From the total of performed corneal transplant, 51% were on the right eye, and 49% were on the left eye

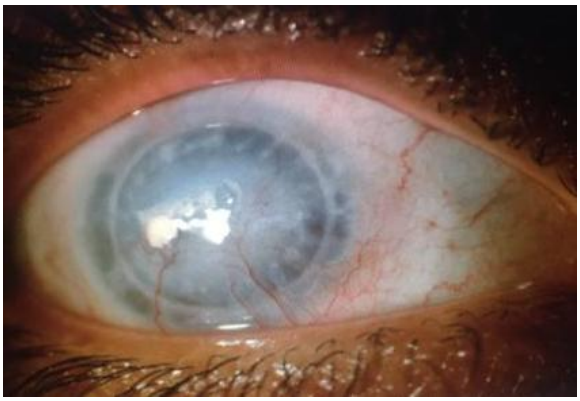
**Table 1:** Indications

| Indication | No.of Cases | %age |
|---|---|---|
| Optical | 108 | 96.4 |
| Tectonic | 3 | 2.7 |
| Cosmetic | 1 | 0.9 |

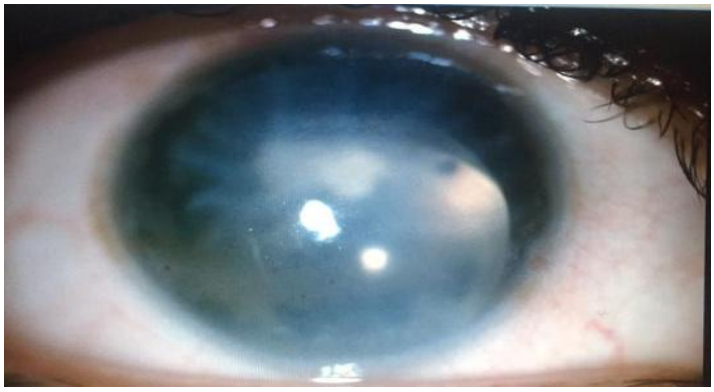
Table 2 shows the most common indication of corneal transplant in our study was Optical Penetrating keratoplasty followed by tectonic followed by cosmetic

**Figure 6:** Showing the Indications of Penetrating Kertatoplasty

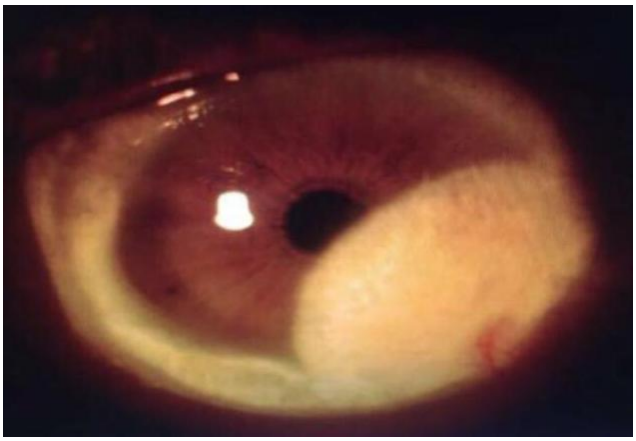
**Advanced Keratoconus**



**Failed Graft**



**Pseudophakic Bullous Keratopathy**



**Lipid Keratopathy**

**Discussion**

This study examined the profile of patients undergoing keratoplasty in terms of age, gender, demographic profile and indication. The mean age was 53.5 years, which is younger than that reported from Canada (69 years) and UK (56 years).[10,11]

Most of the patient were male (54.46%). This is an agreement with other Brazilian studies that also found a predominance of male,with 51.28%[12] 53%(13),59.6% (14) and 55.6% (15). However, other studies found a predominance of female, with 52.7%(16)and 53.2% (17).Contrary to other studies in India, healed keratitis is the most common indication for keratoplasty 18,our study showed Pseudophakic bullous keratopathy as the most common indication. This trend in our study is due to surgical eye camps in the rural areas providing cheap and accessible services for the majority of people suffering from age-related cataract. The increasing trend of Pseudophakic bullous keratopathy can be attributed to the shift in the technique of cataract surgery in rural camps from Extracapsular extraction to phacoemulsification with subsequent damage to endothelial cells.[19,20]

Another study from Southern India[21] has shown the bullous keratopathy to be the most common indication for penetrating keratoplasty which is which is consistent with our study

Regraft is the most common indication for corneal transplantation in Great Britain[22], however bullous keratopathy was the most common indication in the USA.[23]

Many studies conducted in western countries reported Fuchs endothelial dystrophy as an important indication with the rate of 9.3% to 23.2%.[24] However it was a rare condition in our study and other studies present in Iran.[25,26]

In Conclusion Pseudophakic bullous keratopathy remains the leading indication for keratoplasty, resembling previous reports from USA. The incidence of bullous keratopathy has increased probably due to shift in cataract surgery technique

from extracapsular cataract extraction to phacoemulsification with resultant damage to endothelial cells.

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