

## To Evaluate the Sociodemographic Factors And Etiology of Corneal Neovascularisation at out Patient Department of M.L.B Medical College, Jhansi.(U.P)

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### Abstract

**Background :** Corneal neovascularization is a sight-threatening condition which may contribute to corneal graft rejection.

**Aim:** To evaluate the sociodemographic factors and etiology of corneal neovascularisation at out patient department of M.L.B Medical college, Jhansi.

**Material and methods:** It is a hospital based cross sectional study done on 40 eyes of 40 patients of either sex suffering from corneal neovascularisation attending the ophthalmology O.P.D from february 2014-february 2015 of M.L.B Medical college, Jhansi (U.P.) Each patient underwent a detailed ophthalmic examination and history was taken.

**Statistical Analysis:** Data analysis was done by Epi.info 7.1.3.0 software. Frequencies and percentages were calculated for all qualitative variables, i.e. gender, age groups, causes of corneal vascularization. Mean±SD was computed for age.

**Results:** Corneal neovascularisation was found to be more common in males(67.5%) belonging to low socioeconomic status (50%) and is common in patients having history of infection (25%) and prior contact lens wear (22.5%).

**Conclusion:** Corneal neovascularisation is a sight debilitating and cosmetically unsightly disease very commonly associated with infections and contact lens wear, so early detection and management and avoidance of factors predisposing to it is essential.

**Keywords :** corneal neovascularisation, graft rejection, contact lens, infection, sight threatening.)

### I. Introduction

The cornea is the transparent avascular tissue of the eye, for which its transparency is essential for optimal clarity and vision. The cornea is an immune-privileged site; immune privilege is a dynamic phenomenon in which the immune response to antigens is absent in order to protect this highly organized structure of the eye. The lack of blood and lymphatic vessels in a normal cornea prevents entering innate and adaptive immune system cells and behaves as a mechanical barrier. Corneal neovascularization (NV) occurs when the balance between angiogenic and anti-angiogenic factors is tilted towards angiogenic molecules. Corneal neovascularisation is the in growth of blood vessels into the avascular corneal tissue secondary to chronic hypoxia, chronic inflammatory disease, trauma or anterior segment pathology including interstitial keratitis, Mooren's ulcer formation and Terrien's marginal degeneration. It can further be divided into superficial and deep. Persistent corneal vascularization is undesirable for various reasons. It is a major risk factor for corneal graft survival. Apart from graft rejection, vascularization can cause edema, scarring, and lipid keratopathy leading to decrease in visual acuity<sup>[1]</sup>.

### II. Material And Methods

The proposed study was carried out at the Department of Ophthalmology, MAHARANI LAXMI BAI MEDICAL COLLEGE, JHANSI (U.P.)

- **Study design:** Cross sectional study
- **Study location:** M.L.B Medical college, Jhansi(U.P)
- **Study duration:** Patient attending ophthalmology O.P.D from february 2014-february 2015

#### 2.1 Patients selection:

- **Inclusion criteria:**
  - 1) 10 years of age or more
  - 2) with superficial and or

- 3) deep corneal vascularisation up to two quadrants and,
  - 4) with healed corneal disease.
- **Exclusion criteria:** Patients having following were excluded from the study:
    1. Patients with active inflammation of the ocular surface
    2. history of herpes simplex keratitis of less than three months duration in same eye
    3. An active corneal stromal infiltrate,
    4. a corneal epithelial defect,
    5. adherent leucoma,
    6. uveitis,
    7. raised intraocular pressure (IOP)
    8. corneal dystrophies
    9. corneal degeneration
    10. Any chronic comorbid eye condition like cataract, glaucoma, diabetic retinopathy, hypertensive retinopathy etc.
- Patients satisfying the inclusion criteria signed an informed consent before participating in the study.

### **III. Methodology**

- A total of 40 eyes of 40 patients of either sex suffering from corneal neovascularisation were taken .
- Each patient underwent a detailed ophthalmic examination as follows:

#### **Ophthalmic Evaluation**

**HISTORY:** regarding the

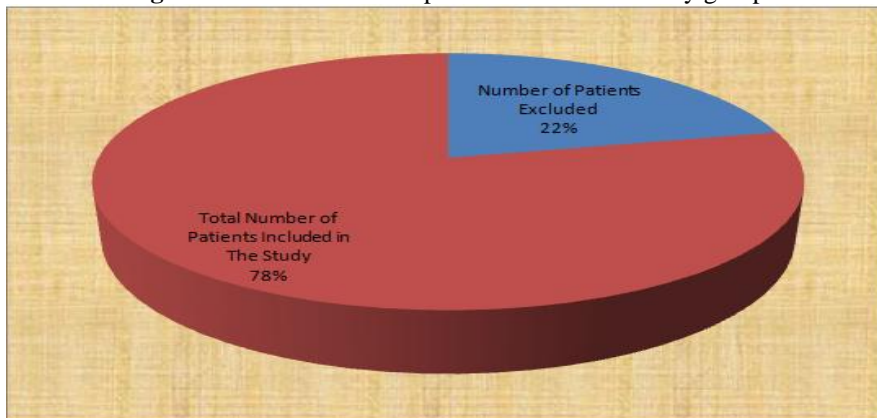
1. Visual symptoms :
  - Diminution of vision
  - Loss of transparency of cornea
  - Continuous pain in the eye
  - excessive tearing
  - sensitivity in eye
  - redness
2. Previous ophthalmic history of:
  - ocular infection
  - Trauma
  - Chemical burn like alkali
  - Contact lens wear
  - Metabolic disorder
  - Corneal transplant
  - Vitamin deficiency
  - Dry eye
  - Vernal keratoconjunctivitis
3. Family history of: any metabolic disorder
4. Past history regarding previous treatment of corneal vascularization with laser, systemic steroids, and immunosuppression was also noted
5. Current medication
6. Social history
7. Allergies
  - Visual acuity measurement
  - Pupil examination
  - Intra ocular pressure measurement
  - Examination by torch light or ophthalmoscope
  - Slit lamp examination
  - Gonioscopy
  - All data were recorded in a predesigned proforma.

- Data analysis was done by Epi.info 7.1.3.0 version. Frequencies and percentages were calculated for all qualitative variables, i.e. gender, age groups, causes of corneal vascularization. Mean±SD was computed for age.

#### IV. Results And Observations

A total of 53 eyes of 51 patients attending the out patient department, having corneal neovascularisation, who fulfilled the inclusion criteria, were included in this study, 11 patients were excluded later on for various reasons, finally leaving with us 40 eyes of 40 patients after exclusion.

**Figure 1 :** Total number of patients included in study group



**Table-1:** Age distribution in study group (N=40)

Age group (years)	Number of patients	Percentage (%)
11-30	13	32.5%
31-50	15	37.5%
51-70	12	30%

Out of 40 patients included in the study, majority (37.5%) of the patients belonged to 31-50 yrs age group followed by 11-30 yrs age group (32.50%) and least from 51-70 yrs age group (30%). The mean age of 40 patients included in our study was  $41.32 \pm 16.45$  years.

**Table-2:** Gender distribution in study group.(N=40)

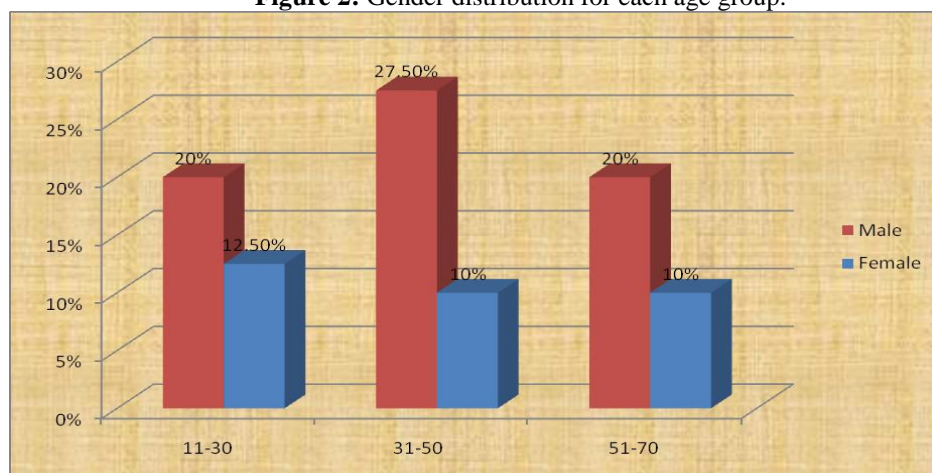
Sex	Frequency	Percentage
Male	27	67.5%
Female	13	32.5%

In our study out of 40 patients satisfying the inclusion criteria, 27 (67.5%) patients were male showing a male preponderance and 13 (32.5%) were female.

**Table 3:** Composite data of age and sex distribution in study group

Age group (years)	Number of patients	Male		Female	
		No.	%	No.	%
11-30	13	8	20%	5	12.5%
31-50	15	11	27.5%	4	10%
51-70	12	8	20%	4	10%
<b>Total</b>	<b>40</b>	<b>27</b>	<b>67.5%</b>	<b>13</b>	<b>32.5%</b>

**Figure 2:** Gender distribution for each age group.



- The study group includes 27 (67.5%) males and 13 (32.5%) females. Majority of the males were from 31-50 yrs age group (27.5%) while most of the females belonged to 11-30 yrs age group (12.5%).

**Table 4:** Socio economic status of the study group (N=40)

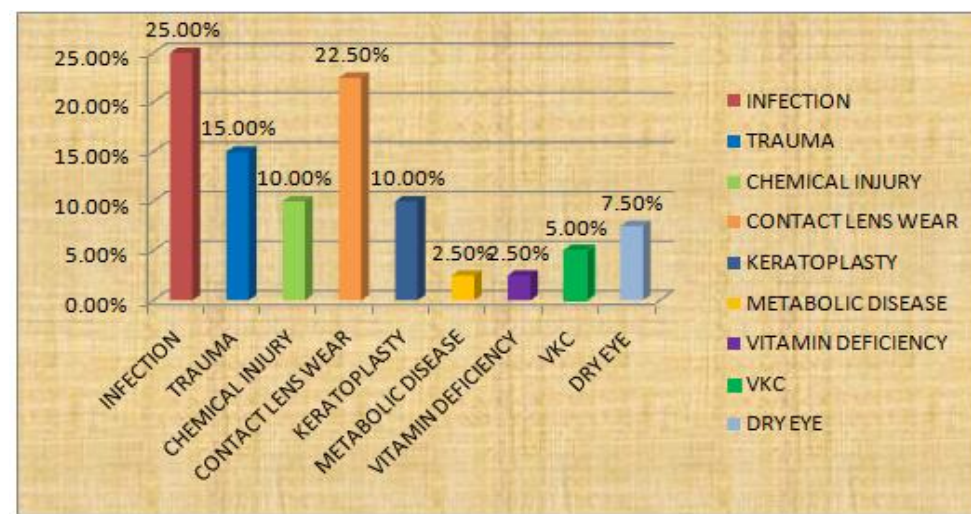
Socioeconomic status	Number of patients	Percentage
High	3	7.5%
Medium	17	42.5%
Low	20	50%

Most of the patients i.e. twenty (50%) in the study group were from low socioeconomic strata.

**Table-5:** Etiological factors for corneal neovascularisation (N=40)

Etiological Factors	Frequency	Percentage
Infection	10	25.00%
Trauma	6	15.00%
Chemical injury	4	10.00%
Contact lens wear	9	22.50%
Keratoplasty	4	10.00%
Metabolic disease	1	2.50%
Vitamin deficiency	1	2.50%
VKC	2	5.00%
Dry eye	3	7.50%

**Figure-3:** Percentage of various etiological factors for corneal neovascularisation in our study group.



In our study, infection came out to be the most common cause or etiological agent of corneal neovascularisation accounting for 25% (10 out of 40) of patients followed by contact lens wear accounting for 22.50% (9 out of 40) patients. Six (15%) patients were having history of trauma in the past subsequently developing corneal neovascularisation. 10% (4 out of 40) had undergone keratoplasty due to various corneal diseases later on developing graft rejection and ultimately corneal neovascularisation. Four (10%) patients had history of chemical burn due to accidental exposure to alkali in their eyes. 7.5% (3 out of 40) and 5% (2 out of 40) of patients included in our study had dry eye and vernal keratoconjunctivitis respectively as a cause of corneal neovascularisation. Metabolic disorder and vitamin deficiency only accounting for 2.50% (1 out of 40) of cases each.

**Figure-4:** Corneal neovascularisation in a patient after keratoplasty



## V. Discussion

Our ability to see is a highly specialised function, which relies on sophisticated architecture of the human eye. Each ocular structure or tissue has distinct properties and tasks, this pertains also to the vasculature. The perfectly organised vascular tree of the retinal circulation and the avascularity of the cornea serve as examples<sup>[2]</sup>.

Corneal neovascularization (NV) is characterized by the invasion of new blood vessels into the cornea from the limbus. It is caused by a disruption of the balance between angiogenic and antiangiogenic factors that preserves corneal transparency. Immature new blood vessels may lead to lipid exudation, persistent inflammation, and scarring, thus threatening corneal transparency and visual acuity

In this study, 40 patients were included out of them 68% were males and 32% were females showing a male preponderance which is consistent with the results of the study conducted by Bhatti N et.al<sup>[1]</sup> in the year 2010 having a gender distribution (66 % males against 34% females), also showing a male preponderance. The study conducted by Sharma A et.al<sup>[3]</sup> in the year 2001 also showed almost similar results with a male preponderance (60% males and 40% females).

### Age Distribution

Most of our patients 15 (38%) belonged to the age group of 31-50 years which is consistent with the results of Sharma A et al<sup>[3]</sup> in 2001 showing preponderance of corneal neovascularisation in patients aged 29 to 54 years. Bhatti N et.al<sup>[1]</sup> in the year 2010 described that most of their patients 16 (32%) belonged to age group of 25-39 years.

### Etiological Factors Of Corneal Neovascularisation

In present study previous infection came out to be the most common etiological agent for corneal neovascularisation. Ten (25%) out of 40 patients gave history of been treated for infective keratitis, some in medical college and remaining by the referring physician for presumed infective keratitis. Infection was followed by contact lens wear (22.50%) and trauma (15%) in frequency as an etiological agent. There were no corneal epithelial defects, infiltrates, oedema, or signs of intraocular inflammation in the eyes studied. All the eyes were quiescent at the time of laser treatment of corneal vessels.

A Sharma et al<sup>[3]</sup> also described infective keratitis (56.67%) as the most frequent etiological factor for corneal neovascularisation, Seventeen of 30 patients had been treated for infective keratitis in our cornea

service, 11 patients for herpes simplex keratitis, 5 for bacterial keratitis and one for fungal keratitis. The remaining 13 patients had been treated by the referring physician for presumed infective keratitis.

## **VI. Conclusion**

Corneal neovascularization is a sight-threatening condition that is associated with corneal graft rejection,<sup>[4]</sup> infections,<sup>[5,6,7]</sup> contact lens wear<sup>[8]</sup>, metabolic disorders and nutritional deficiency states. Advanced stages, in which ingrown blood vessels reach the visual axis, can become permanently vision-threatening and, in patients with corneal grafts, may contribute to rejection.<sup>[9]</sup>

Corneal neovascularisation is a sight debilitating and cosmetically unsightly disease very commonly associated with infections and contact lens wear, so early detection and management and avoidance of factors predisposing to it is essential.

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