ORIGINAL RESEARCH

To estimate a correlation between topographic color patterns, keratometric indices among young adults with peripheral corneal disease

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ABSTRACT
Aim and Objectives: This study tries to estimate the relationship between keratometric indices and peripheral corneal disease and also their relationship with corneal topographic patterns. **Design:** This was an observational study. **Materials and Methods:** Patients between 10–30 years of age with peripheral corneal diseases were included in the study. Keratometry was done to determine k1 and k2 values and corneal topography was done for these patients to study the color patterns. **Results:** The study group included 59 patients having peripheral corneal disease where the mean age of the patients was 23.17 years (standard deviation ± 5.127). There was a statistically significant correlation of k2 with best fit cylinder showing a correlation between keratometric findings with topographic pictures. **Conclusion:** A number of atypical topographic patterns are seen among different peripheral corneal disease and a complete evaluation of keratometric indices and topography is essential for the diagnosis and follow up of these patients.
Keywords: keratometric indices, peripheral corneal disease, topographic color patterns.

INTRODUCTION

A bilateral, asymmetric, progressive, non-inflamatory corneal ectatic illness called keratoconus is characterised by centre corneal thinning and anterior corneal protrusion. [1,2] These modifications may cause higher order aberrations to rise, irregular astigmatism to become more pronounced, progressive myopia, and visual impairment. [3,4] Teenagers are primarily affected by keratoconus (KC).[5]

The capacity to detect both the visual affects and physical discoveries of keratoconus has improved thanks to technological advancements since the 19th century discovery of the keratoscope. [6,7] The diagnosis of KC is aided by a thorough slit-lamp examination enhanced by retinoscopy, extensive recording of refractive error, and corneal topography. The most accurate diagnosis method for keratoconus in its early stages is corneal topography because the traditional slit-lamp indications may not be present. [8,9]

The most crucial elements of the eye's refractive surface are the precorneal tear film and anterior corneal surface. A quantitative description of the corneal surface is provided by the corneal topography. The diagnosis of corneal ectatic disorders can be done extremely well using color-coded contour maps of the cornea. Cool colours like blue and hot colours like red indicate the flat section of the cornea, respectively. As computer-assisted videokeratography advances, we learn more about the corneal surface. [10]

This study tries to estimate the relationship between keratometric indices and peripheral corneal disease and also their relationship with corneal topographic patterns.

MATERIAL AND METHODS

Retrospective enrollment involved 59 patients with bilateral keratoconus and one randomly chosen eye. A thorough ocular examination was performed on all patients, including subjective refraction, best corrected visual acuity (DCVA) assessment, and slit-lamp biomicroscopy to look for evidence of keratoconus in the cornea. Patients having previous corneal surgery or significant corneal scarring were not eligible. Any instance with a corneal topography KISA index value >100% was identified as having keratoconus. The trial lasted for a full year. The participants ranged in age from 10 to 30 years old. The institutional ethics committee gave its approval to

the project. Cases having prior ocular surgery or trauma, as well as those outside of a predetermined age range, were excluded from the study. Symptoms and demographic information were noted.

Snellen's visual acuity chart was used to measure distant visual acuity at a distance of six metres. A corneal topography and anterior segment examination were performed. Depending on their age, Homatropine Bromide 2% eye drops or tropicamide-phenylephrine eye drops were used before wet retinoscopy and autorefractometry (one drop every 10 min apart thrice). On the fourth day, a postmydriatic test was performed. The corneal topography was performed using the Shin-Nippon CT-1000 corneal topographer.

The patient's forehead was pressed against the strap, and his chin was maintained in the chin rest. He was told to focus on the target. The examiner used a joystick to rotate the image and centre the pupil in the centering box. The corneal topographic map was then automatically captured by the device. The instrument captured simulated K (SimK1), SimK2, central K, KISA, skewing of radial axis (SRAX), I-S values, and patterns in color-coded maps.

Statistical analysis was done with SPSS-18.0 version. Qualitative analysis was done with one-t test.

RESULTS

The study group included 59 eyes of patients with keratoconus between 10 and 30 years in age.

TABLE 1: age distribution

Age group	Number of patients	Percentage
10-20	19	32.20%
21-30	40	67.79%
Mean age ±SD	23.17±5.12	

The mean age of patients was 23.17 years. Most of the patients that is 67.79% were from age group 21-30 years and 32.20% were from age group 10-20 years.
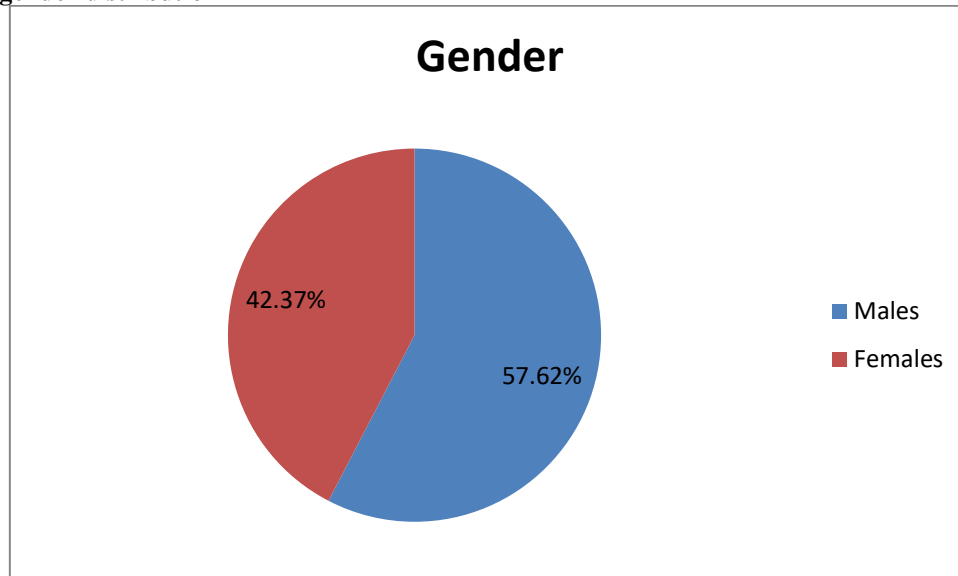
Figure 1: age distribution
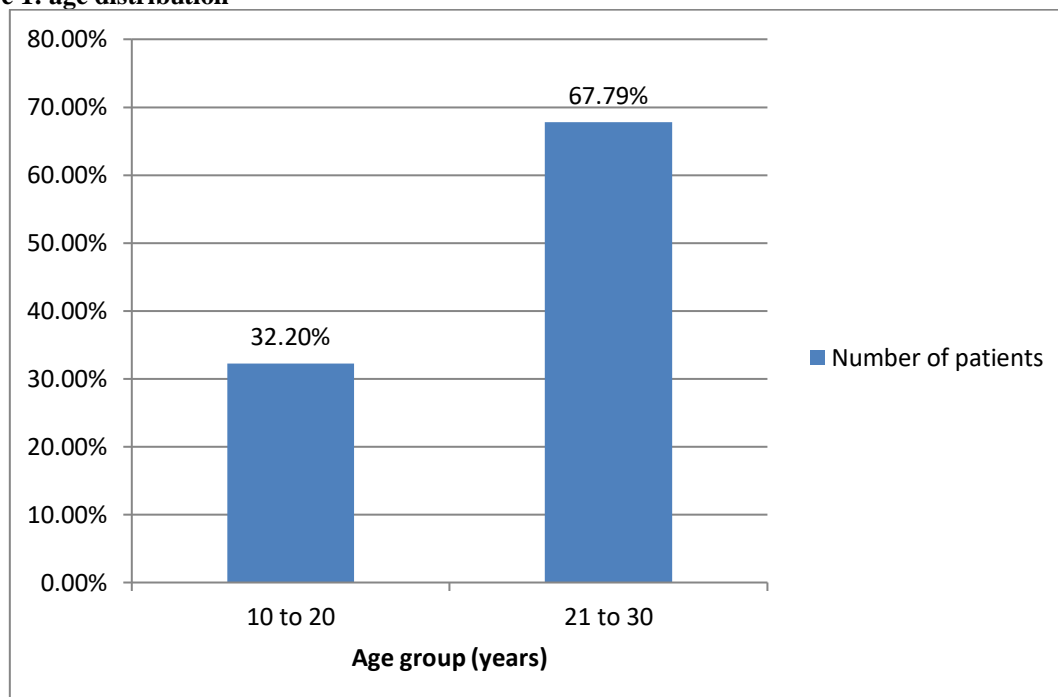
Table 2: gender distribution

Gender	Number of patients	Percentage
Males	34	57.62%
Females	25	42.37%
M:F	1.36:1	

57.62% of the patients were males and 42.37% were females. Male predominance was seen in the present study with male: female ratio of 1.36:1.

Figure 2: gender distribution

Table 3: various parameters

Various parameters	Mean ±SD
Maloney	42.48±5.09
Index	43.30±6.18
Best	5.13±2.65
Fit cylinder	6.31±3.07
Left k1	41.39±4.07
Left k2	42.27±4.97
Right k1	41.37±5.25
Right k2	40.90±3.95

The mean value of Maloney was 42.85, index was 43.30, best was 5.13, fit cylinder was 6.31, left k1 was 41.39, left k2 was 42.27, right k1 was 41.37 and right k2 was 40.90.

Figure 3: various parameters
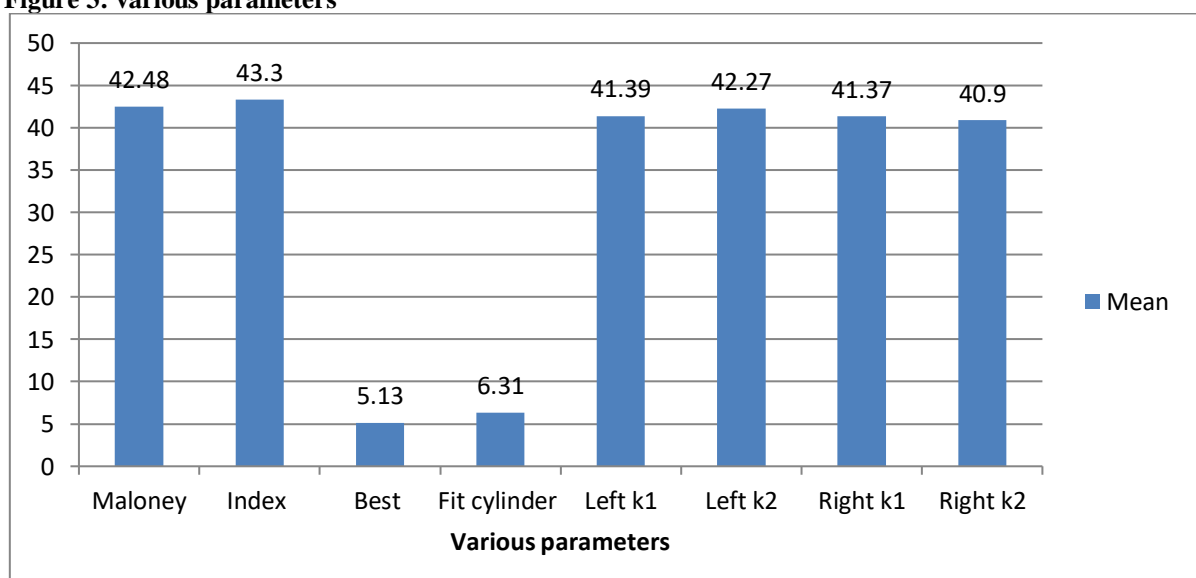
Table 4: Correlation between various parameters

Various parameters	P value	Significance
Left K1 WITH MALONEY	0.03	Significant
Left K2 with MALONEY	0.39	Insignificant
Right K1 WITH MALONEY	0.06	Insignificant

RIGHT K2 WITH MALONEY	0.30	Insignificant
Left K1 with BFC	0.14	Insignificant
LEFT K2 WITH BFC	0.005	Significant
Right K1 with BFC	0.11	Insignificant
Right K2 with BFC	0.001	Significant

A statistically significant correlation was present in between Left K1 WITH MALONEY, LEFT K2 WITH BFC and Right K2 with BFC. A non significant correlation was present in between Left K2 with MALONEY, Right K1 WITH MALONEY, RIGHT K2 WITH MALONEY, Left K1 with BFC and Right K1 with BFC.

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