



Research article

## A STUDY OF OUTCOME OF ROSE K LENSES IN KERATOCONUS

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### ABSTRACT

**Background:** Cornea is affected by several distinct disorders that produce marked thinning without significant inflammation. They are keratoconus, posterior keratoconus, pellucid marginal degeneration, and keratoglobus. keratoconus and posterior keratoconus produces central and inferior thinning with ectasia. **Materials and Methods:** All patients of keratoconus in age group 15 to 60 years at various stages of progression were included this was a prospective study, 20 Eyes of 15 patients of keratoconus in age group of 15 to 60 years at various stages of progression were included in the study. Visual acuity, slit lamp Biomicroscopy was done, corneal topography and Fundus examination was done by both direct and indirect ophthalmoscopy with full dilatation when possible. **Results:** Subjective score of pre rose k eyes when compared to post rose k lens eye was highly significant, which signifies that the same patient was highly satisfied after wearing rose k lens. **Conclusion:** Present study observed that, Rose K lenses improved patient's overall quality of life in moderate and advance cases of keratoconus.

**KEYWORDS:** Keratoconus, Pellucid marginal degeneration, Keratoglobus, rose k lenses.

### INTRODUCTION

Unlike traditional contact lenses, the complex geometry built into every Rose K contact lens closely mimics the cone-like shape of the cornea for every stage of the condition. The result is a more comfortable fitting lens for patients and better sight (visual acuity)<sup>[1]</sup>.

The Rose K lenses' complex geometry has only become possible since computer-controlled contact lens lathes were developed to cut sophisticated oxygen permeable polymers to the right shape. The Rose K lens has a number of features that make it ideal for keratoconus:<sup>[2,3]</sup>

1. Its complex geometry can be customized to suit each eye and can correct all of the myopia and astigmatism associated with keratoconus.
2. They are easy to insert, remove and clean.
3. They provide excellent health to the eye, because they allow the cornea to "breathe" oxygen directly through the lens.
4. Practitioners have the Rose K trial set fitting system which achieves a first fit success in over 80% of patients internationally<sup>[4]</sup>.

As a result, the entire lens fits better over the eye leading to better comfort and optimum visual acuity (sharpness) for patients. However due to the progressive nature of the condition, it is important that lenses are fitted with great care and reassessed at least annually by your eye care.

The present study was undertaken to compare the visual outcome with Rose k lenses in KC patients and to compare change in quality of life after use of rose k lenses.

### MATERIALS & METHODS

This was a prospective study, after taking informed consent, 20 Eyes Of 15 patients of keratoconus, presented at M & J institute of ophthalmology, Ahmedabad were included in the study.

#### INCLUSION CRITERIA

All patients of keratoconus in age group 15 to 60 years at various stages of progression were included in study.

#### EXCLUSION CRITERIA

Patients of KC associated with other ocular anomalies like retinitis pigmentosa, lebersamaurosis, aniridia, corneal degenerations, dystrophies, congenital cataract, lenticonus, ectopialentis, floppy eyelid syndrome. Patients with systemic

syndrome osteogenesis imperfect, ED syndrome, crouzos syndrome, MVP<sup>[5]</sup>.

Patients were examined at Initial visit, Dispensing Visit and Outcome visit (after 1 month of Rose K lens wear).

Detailed history was elicited from all patients, visual acuity was recorded using Snellen's chart, slit lamp Biomicroscopy, corneal topography and Fundus examination was done by both direct and indirect ophthalmoscopy<sup>[6]</sup> with full dilatation when possible.

A control trial group of 10 patients of patient was also used who used normal lenses for refractive error. Filled questionnaire was collected from both the groups and was compared.

#### VISUAL ACUITY

Both uncorrected and best corrected visual acuity with glasses was checked with standard snellens chart.<sup>[7]</sup>

#### REFRACTION

Retinoscopy, autorefraction, and trial and error method was used.<sup>(8)</sup>

#### BIOMICROSCOPY

Slit lamp biomicroscopy was performed to examine anterior segment in detail with special attention to detect: corneal thinning, vogtsstriae, stromal scarring, fleischers ring, rupture in descemments membrane' vernal keratoconjunctivitis.<sup>[8]</sup>

#### KERATOSCOPY

It was performed to study genera shape of cornea.

#### KERATOMETRY

Keratometry with Bausch and laumbkeratometer<sup>[9]</sup> was performed to measure radius of curvature of centre cornea and dioptric refractive power of cornea.

#### MUNSONS SIGN

Munsons sign was checked by asking patient to look down, to see angulation of lower lid.

#### RIZZUTIS ILLUMINATION TEST

Penlight was thrown from temporal side anterior to iris plane in KC, the ecstatic cornea focuses the light sharply inside nasal limbus.

#### DISTANT DIRECT OPHTHALMOSCOPY

Before ophthalmoscopy pupils are dilated by putting 10% phenylepherine and 1% tropicamide in conjunctival sac. Direct ophthalmoscopy was performed to see the dark area within the illuminated field oil droplet sign<sup>[10]</sup>.

#### INDIRECT OPHTHALMOSCOPY

Fundus examination was difficult with direct ophthalmoscope, due to higher astigmatism for detailed fundus examination indirect ophthalmoscopy was done.

Pachymetry was done to assess the central corneal thickness and to find out the thinnest point of cone.

## RESULTS

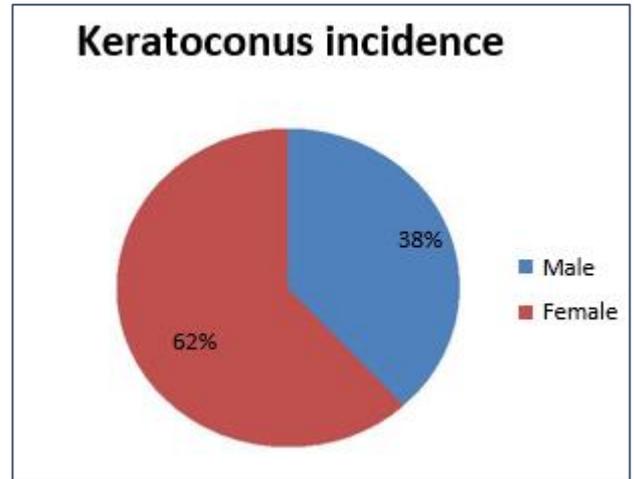


Figure 1. Gender Distribution

Majority of patients studied were female(62%) as compared to male (38%) (Figure 1).

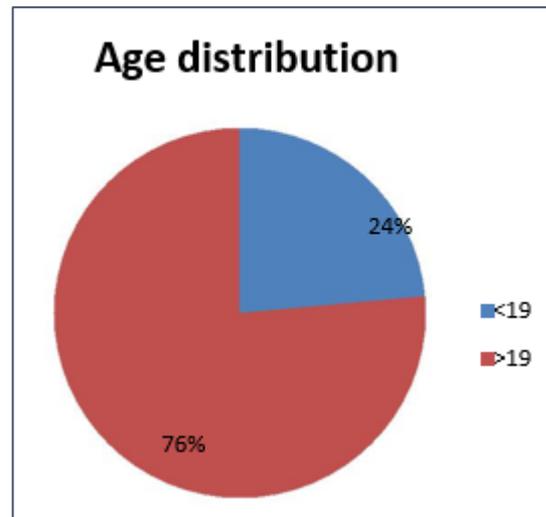


Figure 2. Age Distribution

Majority of patients were above 19 years of age (76%), rest below 19 years (24%) (Figure 2).

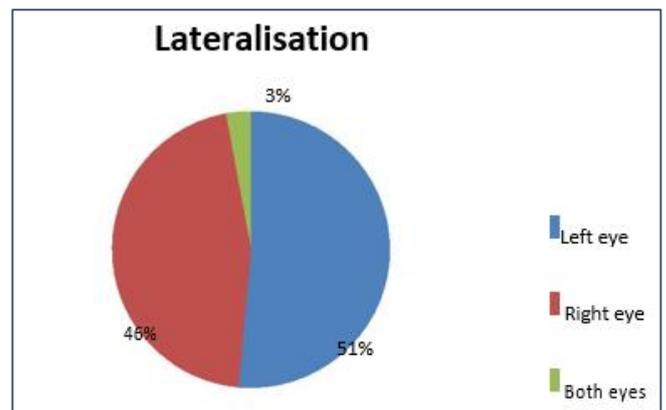


Figure 3. Laterality of Keratoconus

46% of patients were having keratoconus in right eye,51% in left eye, 3% in both eye (Figure 3)

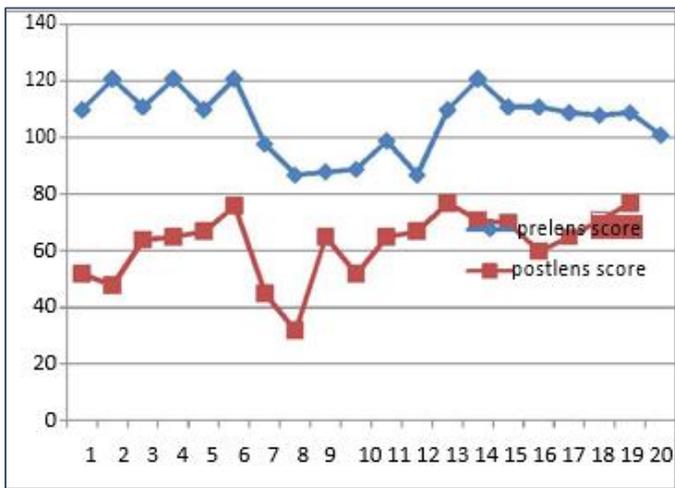


Figure 4. VFQ Score Comparison Pre-lens And Post-lens Use In 20 Eyes

There was marked decrease in post rose k lens VFQ score, which indicates that patients quality of life improved (Figure 4).

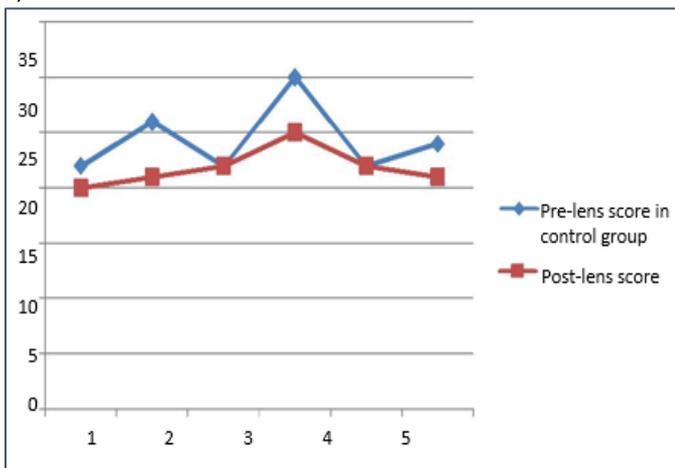


Figure 5. Lens Score Pre and Post

In control group which contained normal patients wearing lenses for refractive error the pre-lens and post-lens score of questioner was non-significant (Figure 5).

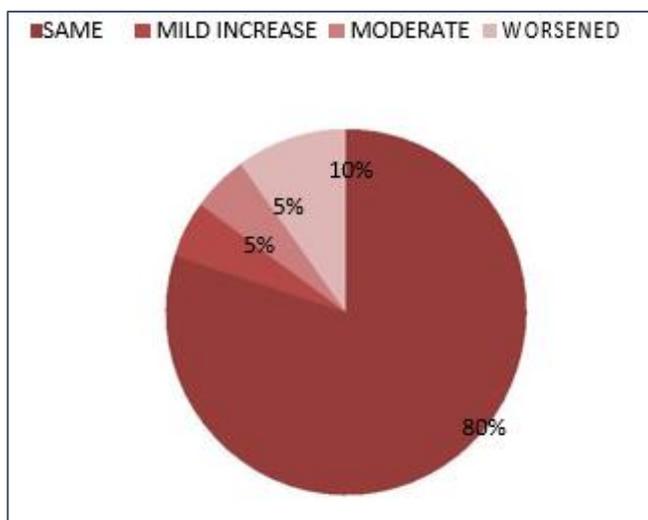


Figure 6. Keratoconus pentacam after use of rose k lens

Pentacam in majority of patients (80%) remained same, in 5% of patients it increased mildly, in 5% moderate increase was seen, 10% worsened (Figure 6).

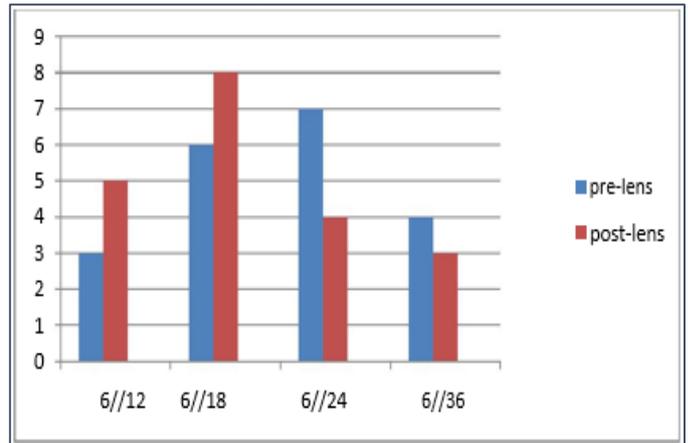


Figure 6. Visual acuity

From above graph (Figure 6) we come to know that no. of patients having visual acuity 6/12 increased from 3 to 5, 6/18 from 5 to 8, and patients having vision 6/24 and 6/36 decreased from 8 to 4 and from 4 to 3.

## DISCUSSION

Pre rose k eyes subjective score when compared to post rose k lens eye the t value was -12.649025,  $p < 0.0001$  indicating that result was significant  $p < 0.05$ , which signifies that the same patient was highly satisfied after wearing rose k lens. Post rose k lens scores when compared to control group who were wearing normal lens, t value was -14.114680. The value of  $p < 0.00001$ , the result is significant at  $p < 0.05$ .

Questionnaire was given to control group of 20 eye persons for pre-lens score and post lens score evaluation. The result is significant with  $p < 0.05$ .

One Indian study done by Preeji Mandhthara Sudharaman shows 80-90% success rate in Rose-K lens fitting in keratoconus (Rose K Lenses for keratoconus-An Indian experience)

In another study done by Karaman A-use softperm contact lenses in patient with Keratoconus found lower improvement. (a retrospective case series use of soft perm contact lenses in Keratoconus patient)

Study of Rose K [11,12] Contact lens for Keratoconus by A.K. Jain in 2007 (Indian J Ophthalmol. 2007 March-April, 55) show same result as our study, very good visual rehabilitation in moderate and good visual rehabilitation in severe Keratoconus eyes.

## CONCLUSION

Rose K lenses improved patient's overall quality of life in moderate and advance cases of keratoconus. Rose K lenses are more comfortable to wear, in patient with keratoconus. Rose-K design rigid contact lenses give 100% visual rehabilitation moderate Keratoconus and 96% visual rehabilitation in patient with severe keratoconus.

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