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VISUAL PROGNOSIS OF KERATOCONUS WITH SCLERAL CONTACT LENSES

Ahmed Sohail, Samia Iqbal* and Zain Ul Abideen

University Institute of Public Health The University of Lahore.

***Corresponding Author: Samia Iqbal**
University Institute of Public Health The University of Lahore.
Email id: samiaiqbal988@gmail.com

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ABSTRACT

Background: Keratoconus is a chronic, bilateral usually asymmetrical, non-inflammatory disorder, being characterized by progressive steepening, thinning and apical scarring of the cornea which result in significant loss of vision. The classic treatment of visual rehabilitation in keratoconus is based on spectacles and contact lenses. **Objective:** To find out visual prognosis of keratoconus with scleral contact lenses. **Method**: A descriptive cross sectional study of 3 months had been carried out at "Keratoconus Pakistan (private specialized keratoconus clinic)" located in Rawalpindi Pakistan. Unaided visual acuity was measured with LogMAR visual acuity chart and then after complete evaluation of the case with the help of pentacam scan and slit lamp scleral contact lenses were fitted according to sagittal depth and keratometry readings and then with over refraction best corrected visual acuity was measured. **Results:** Total of 20 patients were examined, out of which (95%) were males and (5%) were females. (45%) were between the age of 15-25 years,(40%) were between the age of 26-35years,(15%) were between the age of 36-50years.(35%) patients were from the province of Punjab, (30%) were from Khyber Pakhtunkhwa,(20%) were from Sindh,(10%) were from Balochistan and (5%) were from Federal area of Pakistan. Out of total patients Unaided visual acuity from 6/9- 6/18 were (30%), 6/24-6/60 were (20%) and <6/60-counting fingers were (50%). Best corrected visual acuity of 6/6 were (55%), 6/9 were (30%) and 6/12 were (15%).Conclusion: In my study it was concluded that male patients were (95%) and female patients were(5%) and maximum patients were from the province of Punjab (35%). Scleral contact lenses are best option for the management of keratoconus because these lenses can provide best vision compared to other type of contact lenses with maximum comfort and wearing time. In most cases scleral contact lenses can be a best alternative to keratoplasty and other type of invasive corneal treatments and better visual results can be obtained after corneal cross linking (CXL).

INTRODUCTION

Keratoconus is a chronic, bilateral usually asymmetrical, non-inflammatory disorder,being characterized by progressive steepening, thinning and apical scarring of the cornea. Initially the patient remains asymptomatic but the visual acuity gradually start decreasing resulting in significant vision loss due to the development of irregular astigmatism, myopia, corneal thinning and scarring. The classic treatment of visual rehabilitation in keratoconus is based on spectacles and contact lenses.[1]

Both genetics and environment paly a role in development of keratoconus.[2] The frequency of this disease in first degree relatives is much higher than the general population.[3] Keratoconus is also associated with Down's syndrome.[2]

All corneas, like any other tissues in the body create harmful byproducts (free radicals) of cell metabolism.

These byproducts are very harmful for corneal health and physiology. Normal corneas like any other body tissue have a defense system to neutralize the free radicals so they don't damage the collagen. But in keratoconus anti-free radical system of cornea does not work properly and free radical thus weakens the collagen fibers and damage the cornea.[4,5] Some antioxidant enzymes related activity had also been seen in normal as well as keratoconus cornea and their presence is still controversial. Keratoconus corneas are more easily damaged by minor trauma such as eye rubbing.[5]

Poorly fitted contact lenses (that rub against the cornea) have been Suggested as a possible cause of keratoconus. This has not been proven and remains questionable.[6] However the link to allergic disease also remains unclear but a higher percentage of keratoconus patients have atopic disease than the general population. Disorders such as hay fever, eczema, asthma and food allergies are all considered atopic diseases. Those with keratoconus are advised to stop eye rubbing as much as possible.[7,8]

In the mildest form of keratoconus, eyeglasses or soft contact lenses may help but as the disease progresses and

the cornea becomes thin and irregular in shape, glasses and regular soft contact lens designs no longer provide adequate vision correction.[9] Treatment for progressive keratoconus include: 1. Corneal cross linking (CXL) 2. Custom soft contact lenses 3. Gas permeable contact lenses, "Piggyback" contact lenses 5. Scleral contact lenses, Corneal intacs.[10,11]

Glass scleral lenses first discovered in 1888.[12] French ophthalmologist Eugene Kalt first fitted the scleral lens to keratoconic patients and found a significant improvement in vision.[13] PMMA scleral lenses was first discovered in 1938 by Feinbloom and Obrig but was not successful because corneal edema was very common with this material.[14,15,16] The development of rigid gas permeable plastic material greatly reduced the problem of corneal edema and it was first utilized for corneal lenses.[17] First practical gas permeable scleral lens was marketed after 1983. [18,19]

MATERIAL AND METHOD

A descriptive cross sectional study of 3 months had been carried out at "Keratoconus Pakistan (private specialized keratoconus clinic)" located in Rawalpindi. Unaided visual acuity was measured with LogMAR visual acuity chart and then after complete evaluation of the case with the help of pentacam scan and slit lamp scleral contact lenses were fitted according to sagittal depth and keratometry readings and then with over refraction best corrected visual acuity was measured.

RESULTS

Total of 20 patients were examined, out of which (95%) patients were male and (5%) were females. (45%) patients were between the age of 15-25 years,(40%) were between the age of 26-35years,(15%) were between the age of 36-50years.(35%) patients were from the province of Punjab, (30%) were from Khyber Pakhtunkhwa,(20%) were from Sindh,(10%) were from Balochistan and (5%) were from Federal area of Pakistan. Out of total patients Unaided visual acuity from 6/9-6/18 were (30%), 6/24-6/60 were (20%) and <6/60-counting fingers were (50%). Best corrected visual acuity of 6/6 were (55%), 6/9 were (30%) and 6/12 were (15%).

Unaided Visual acuity

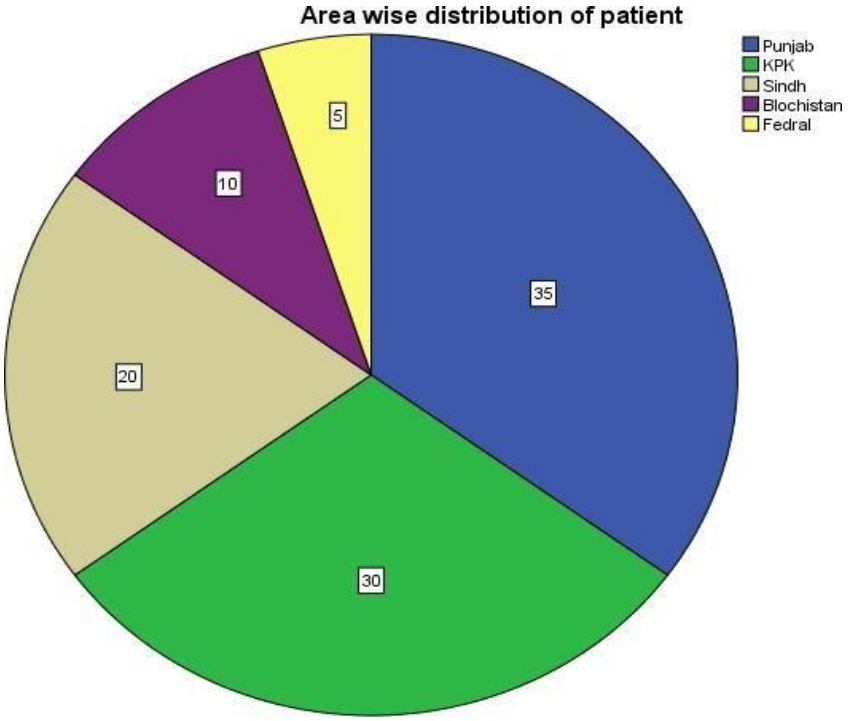
Above table is showing that unaided visual acuity from 6/9-6/18 were (30%), 6/24-6/60 were (20%), <6/60-counting finger were (50%).

Best corrected visual acuity

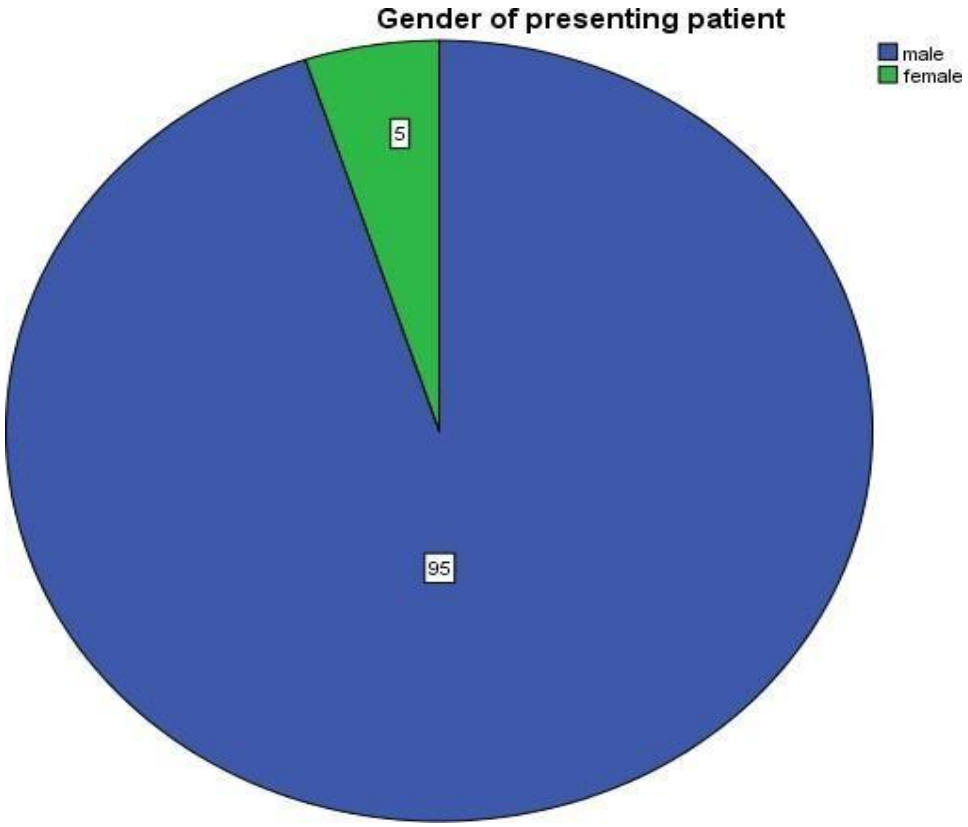
	Frequency	Percent
6/6	11	55.0
6/9	6	30.0
6/12	3	15.0
Total	20	100.0

Above table is showing that best corrected visual acuity of 6/6 were (55%), 6/9 were (30%), 6/12 were (15%).

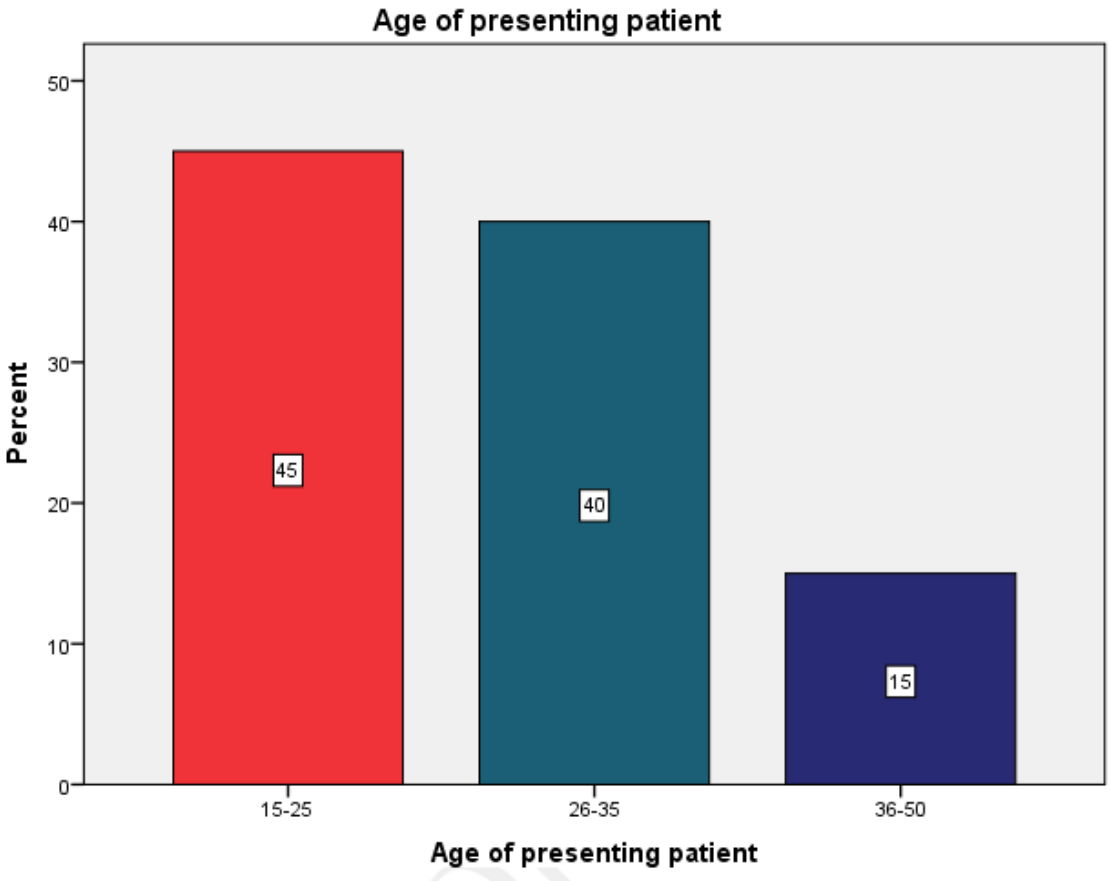
	Frequency	Percent
6/9-6/18	6	30.0
6/24-6/60	4	20.0
<6/60-CF	10	50.0
Total	20	100.0



Above chart is showing that (35%) patients were from the province of Punjab, (30%) were from KPK, (20%) were from Sindh, (10%) were from Blochistan and (5%) were from Fedral area.



Above chart is showing that (95%) patients were Males and (5%) were females.



Above chart is showing that (45%) patients were between the age of 15-25, (40%) were between the age of 26-35 and (15%) were between the age of 36-50.

DISCUSSION

The aim of my study was to evaluate the visual prognosis of keratoconus with scleral contact lenses. This type of study was never done in Pakistan before. A very close study was done in U.S in august 2016 by bergmanson JP and others And they Concluded that scleral contact lenses provide best vision and also best comfort compared with other type of contact lenses.[20] Another study was done in france 2015 by Picot c and others but that study was On quality of life in patients wearing scleral contact lenses and my topic was On visual prognosis with scleral lenses in keratoconus.[21]

CONCLUSION

With this study I concluded that Scleral contact lenses are best treatment option For keratoconus compared with other type of lenses and spectacles because these lenses vault the cornea completely and eliminate the corneal irregularities and provide best vision.

Scleral lenses can also be customized According to the shape of cone of every patient which eventually provides an optimum Fitting to the patient and eliminate the discomfort completely as these lenses rest on sclera.

Scleral lenses are also best alternative to corneal intacs and penetrating keratoplasty.

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