RESULTS

This study provided an evaluation of prevalence of corneal ectasia among candidates of LASIK surgery who showed normal pattern of corneal topography. A total of 400 eyes were included during the period from 1-5-2010 till 30-7-2010.

Patient's demographic data:

✍ *Age and sex distribution:*

Table 1 shows the age and sex distribution of the 400 eyes included in our study. The patients were between 6 years and 56 years of age with mean age of 28.1 years. There were 250 male (62.4%) and 150 female (37.6%) patients *(Fig. 60).*

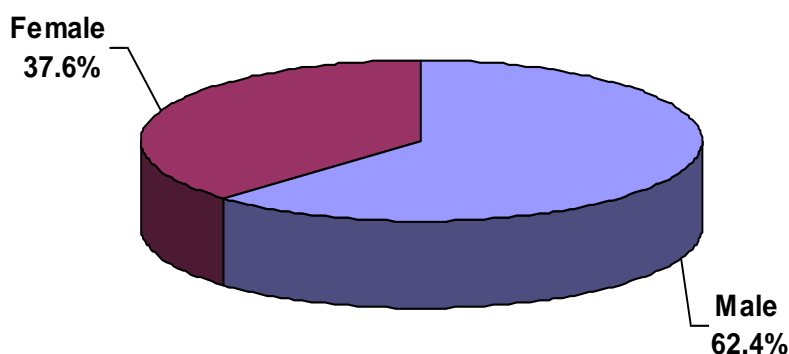|	N = 400	
➢ **Age (years)** X±SD	28.1±9.97	
Range	(6-56)	
➢ **Gender**	N	%
Male	250	62.4
Female	150	37.6

Table (1): Age and sex distribution

Fig.62: Age and sex distribution

From the refractive map the following data were statistically analyzed: Table (2), (Fig.61, 62 &63)

- K1: The mean K1 was 41.35 ± 1.17D in the normal group and 43.90 ± 2.15D in the ectatic group.
- K2: The mean of K2 was 44.19 ± 4.8 D in the normal group and 46.32 ± 2.10D in the ectatic group.
- Steepest K: The mean of the Steepest K was 44.52 ± 1.26D in the normal group and 48.34 ± 2.23D in the ectatic group.
- K reading at the thinnest location: the mean of the K reading at the thinnest location was 43.16 ± 1.14D in the normal group and 46.85 ± 1.69 in the ectatic group.
- Elevation of the corneal front surface off the best fit sphere at the thinnest location: the mean elevation was $4.54\pm2.95\,\mu$m in the normal group and 18.37 ± 17.15 μm in the ectatic group.
- Elevation of the corneal back surface off the best fit sphere at the thinnest location: the mean elevation was 3.76 ± 4.70 μm in the normal group and 28.11 ± 23.98 μm in the ectatic group.

		Normal	Ectatic
K1	Mean	**41.35**	**43.90**
	S.D	**1.17**	**2.15**
K2	Mean	**44.19**	**46.32**
	S.D	**4.8**	**2.10**
Steepest K	Mean	**44.52**	**48.34**
	S.D	**1.26**	**2.23**

K reading at the thinnest location	Mean	43.16	46.85
	S.D	1.14	1.69
Elevation of corneal front surface at the thinnest location	Mean	4.54	18.37
	S.D	2.95	17.15
Elevation of corneal back surface at the thinnest location(μm)	Mean	3.76	28.11
	S.D	4.70	23.98

Table (2): Illustrating the mean and the standard deviation of: K1, K2, steepest K, K reading at the thinnest location, elevation of the corneal front and back surface at the thinnest location .
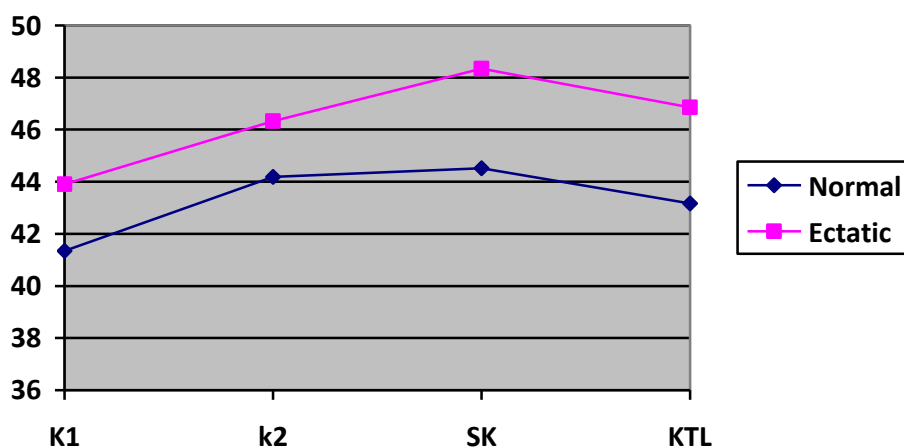

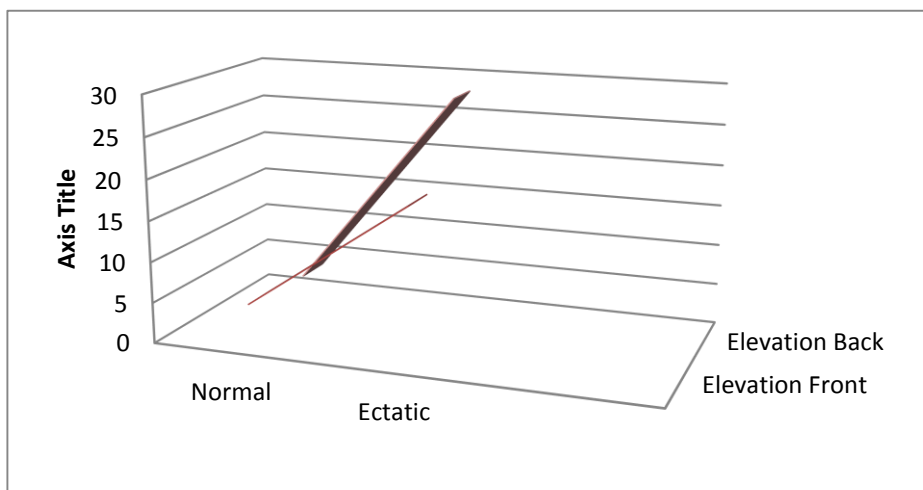**Fig.63:** Illustrating the mean and the standard deviation of: K1, K2, steepest K, K reading at the thinnest location

Fig.64: Illustrating elevation of the corneal front and back surface at the thinnest location .
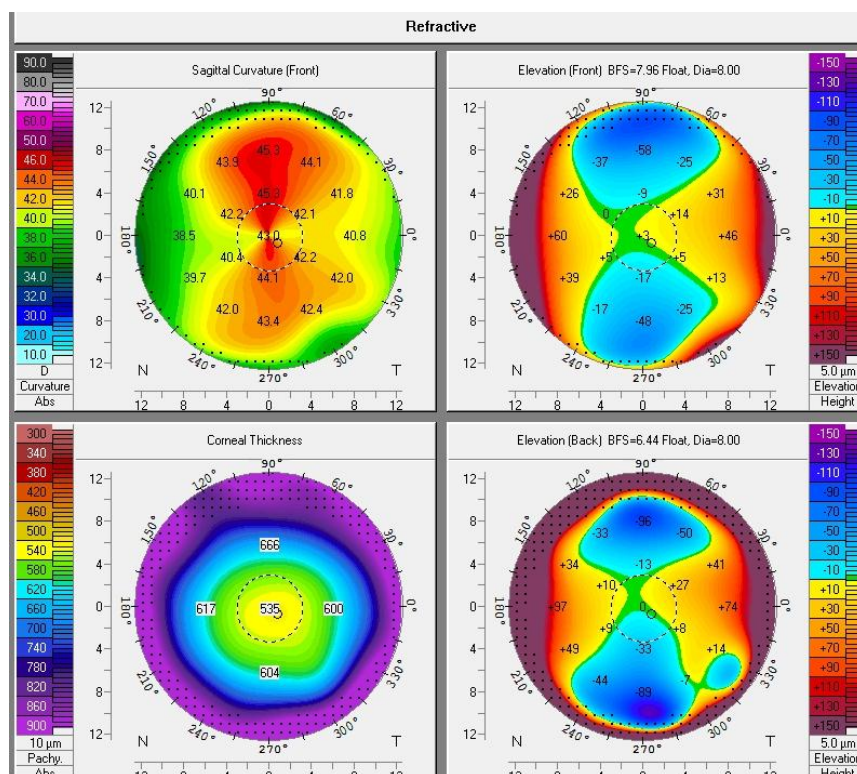

Fig.65: refractive map

The corneal thickness profile: Table (3), (Fig.64&65)

✤ Average progression index (PI):

- The mean average PI was 0.84 ± 0.13 in the normal group and 1.41 ± 0.36 in the ectatic group.

Average PI	Normal	Ectatic
Mean	**0.84**	**1.41**
S.D	**0.13**	**0.36**

Table (3): Illustrating the mean and standard deviation of the average progression index.
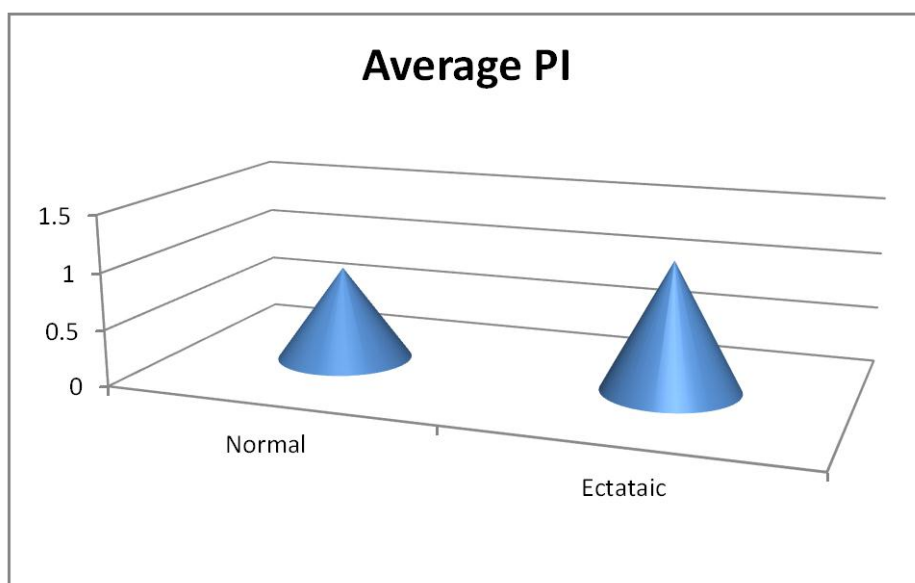
Fig.66: Illustrating the mean and standard deviation of the average progression index.
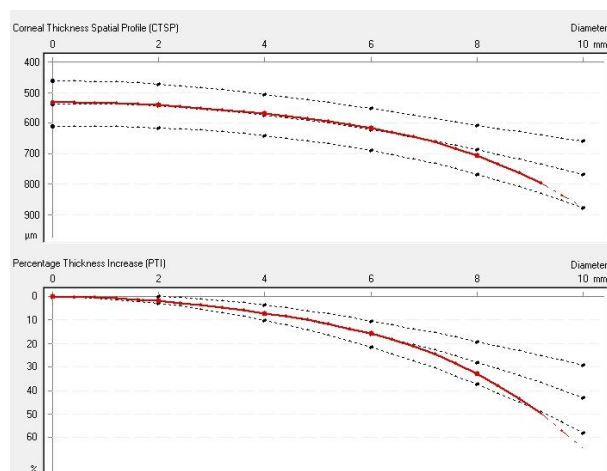
	0 mm	2 mm	4 mm	6 mm	8 mm	10 mm
C. Thickness / μm	532 ± 0	542 ± 2	570 ± 7	616 ± 14	707 ± 28	876 ± 71
Progression / %	0 ± 0	2 ± 0	7 ± 2	16 ± 5	33 ± 10	65 ± 24

Prog.-Index Axis

Min: 0.7   11 °
Avg: 1.1
Max: 1.2   191 °

Fig.67: Average progression index (PI):

Belin Ambrosio Enhanced Ectasia display

✎ **Pachymetric data (Fig.66)**

Pachy Apex: 511μm
Pachy Thin. Locat.:   ○   506μm
Dist. Apex-Thin.Loc.:   IT   0.48mm

Progression Index:
Avg: 1.66   QS: OK
Min: 1.57   Max: 1.84

Fig.68: Pachymetric data

A- The apex-thinnest location distance: Table (4), (Fig.67)

- The mean apex-thinnest location distance was 0.55 ± 0.19 in the normal group and 0.91 ± 0.31 in the ectatic group.

Apex-thinnest location distance	Normal	Ectasia
Mean	0.55	0.91
S.D	0.19	0.31

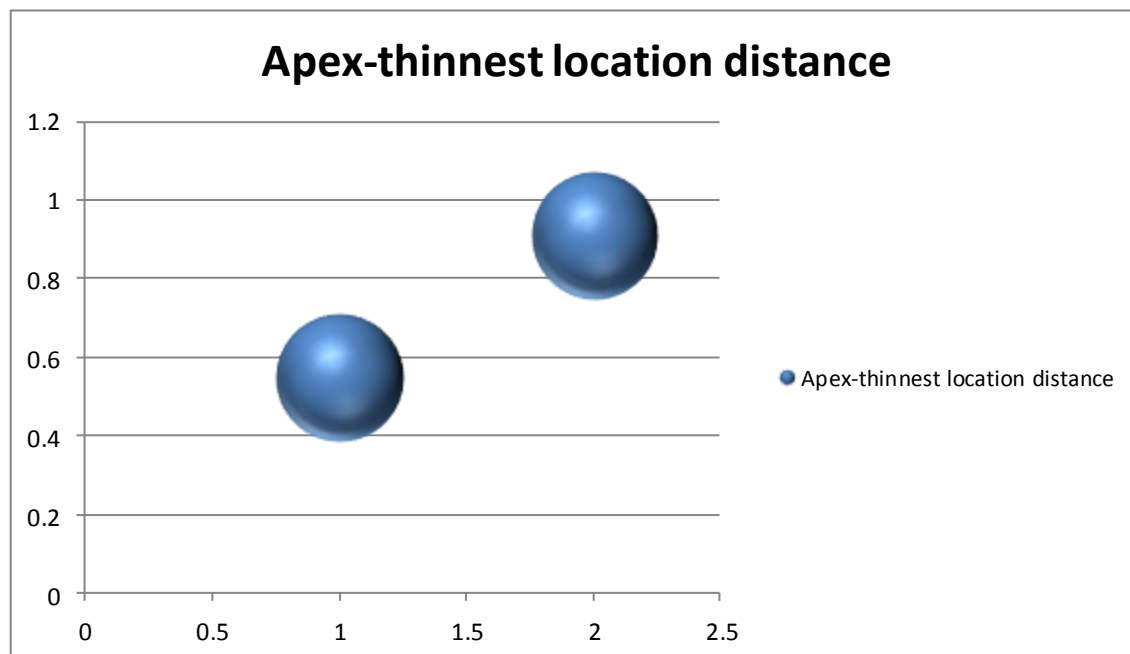**Table (4):** Illustrating the mean and standard deviation of the apex-thinnest location distance.

Fig.69: Illustrating the mean and standard deviation of the apex-thinnest location distance.

B- The Pachymetric difference between the apex and the thinnest location: Table (5), (Fig.68)

- The mean thinnest pachymetry was 547.39±29.31µm in the normal group and 473.06±36.68 µm in the ectatic group.
- The mean apical pachymetry was 549.17±28.39µm in the normal group and 483.91±34.41µm in the ectatic group.
- The mean Pachymetric difference between the apex and the thinnest location: was 2.09±1.70 µm in the normal group and 10.66±7.60 µm in the ectatic group

		Normal	Ectatic
Thinnest pachymetry(µm)	**Mean**	**547.39**	**473.06**
	S.D	**29.31**	**36.68**
Apical pachymetry(µm)	**Mean**	**549.17**	**483.91**
	S.D	**28.39**	**34.41**
Pachymetric difference between the apex and the thinnest location(µm)	**Mean**	**2.09**	**10.66**
	S.D	**1.70**	**7.60**

Table (5): Illustrating the mean and the standard deviation of the thinnest pachymetry, apical pachymetry and the pachymetric difference between the apex and the thinnest location .
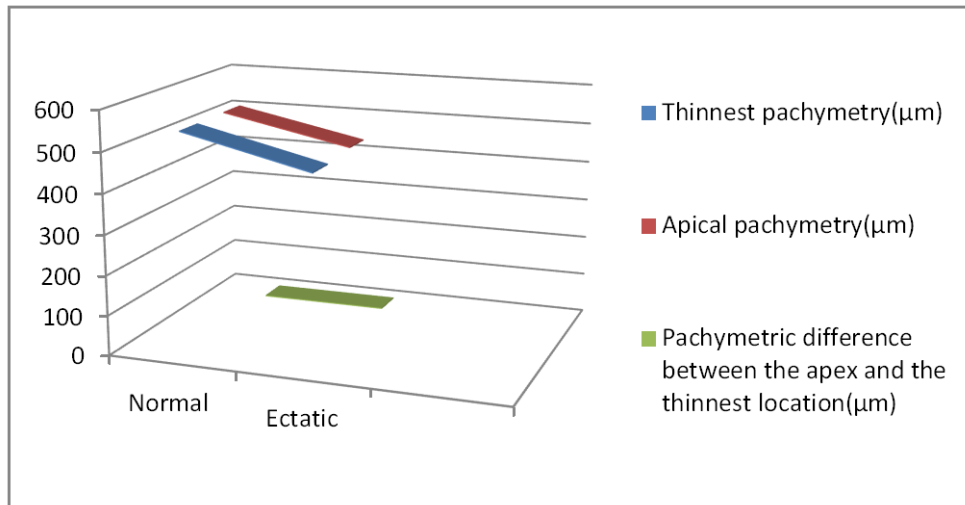
Fig.70: Illustrating the mean and the standard deviation of the thinnest pachymetry, apical pachymetry and the pachymetric difference between the apex and the thinnest location .

✍ **2- Elevation data**

A- Corneal front surface: Table (6), (Fig: 69, 70, 71&72)

- The mean elevation of the corneal front surface off the BFS at the thinnest location in the baseline map was $2.31\pm1.46\mu m$ in the normal group and 11.73 ± 9.19 μm in the ectatic group.
- The mean elevation of the corneal front surface off the enhanced BFS at the thinnest location in the exclusion map was 6.34 ± 2.80 μm in the normal group and 18.40 ± 12.95 μm in the ectatic group.
- The mean elevation difference of the corneal front surface at the thinnest location in the difference map was 4.02 ± 1.80 μm in the normal group and 6.64 ± 5.04 μm in the ectatic group.

Corneal front surface elevation at the thinnest location		Normal	Ectatic
Base line map (μm)	Mean	2.31	11.73
	S.D	1.46	9.19
Exclusion map (μm)	Mean	6.34	18.40
	S.D	2.80	12.95
Difference map(μm)	Mean	4.02	6.64
	S.D	1.80	5.04

Table (6) illustrates the mean and the standard deviation of the elevation of the corneal front surface off the BFS at the thinnest location in the base line map, elevation of the corneal front surface off the enhanced BFS at the thinnest location in the exclusion map and elevation difference of the corneal front surface at the thinnest location in the difference map .
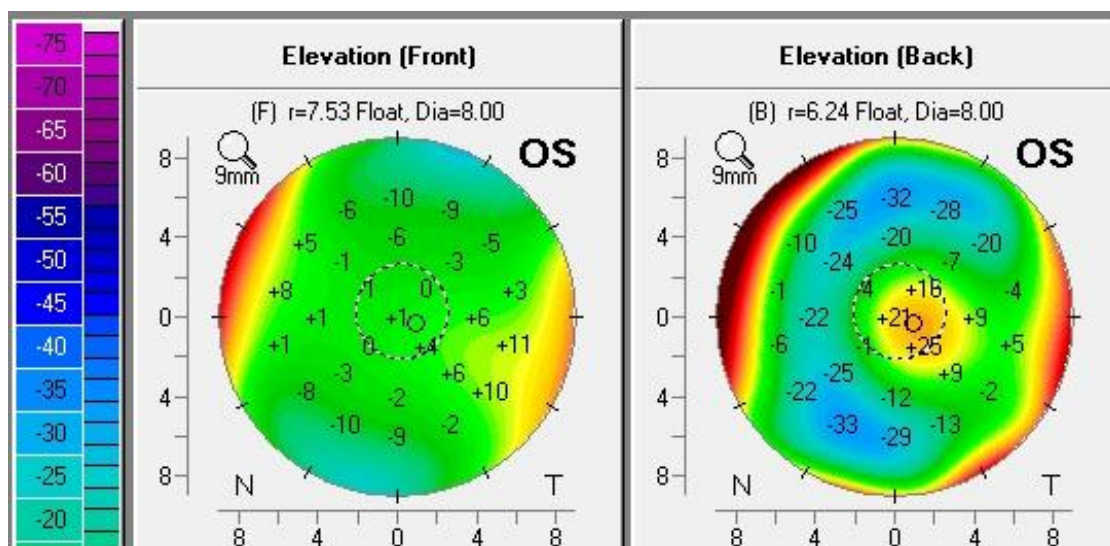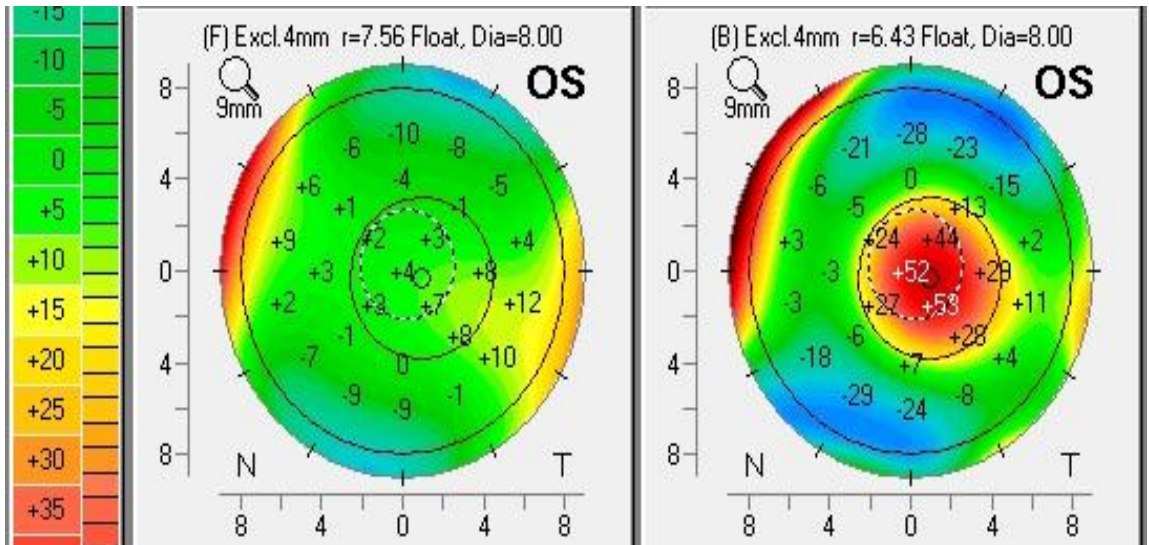

Fig.71: Elevation Display Interpretation

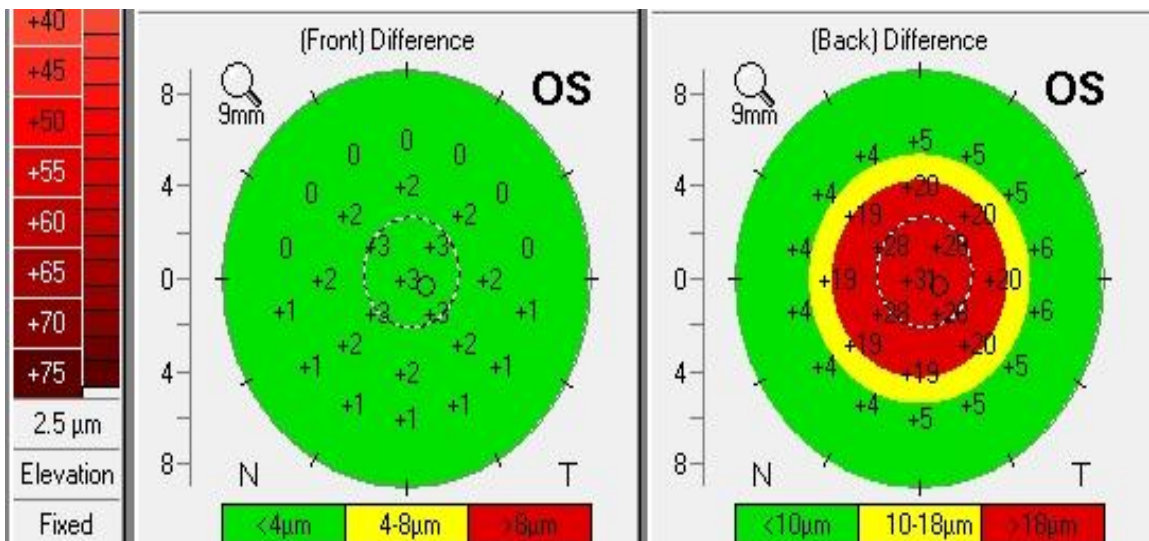*Fig.72:* Exclusion maps Interpretation

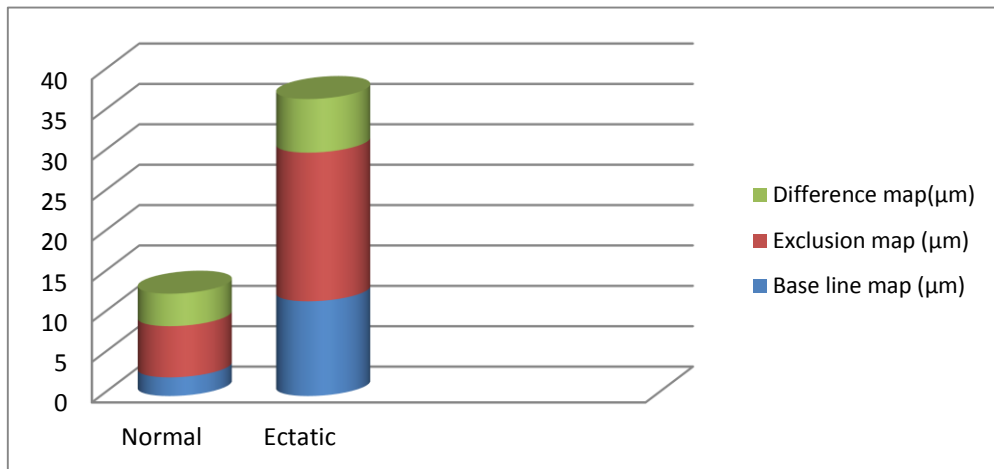*Fig73:* Difference maps Interpretation

Fig.74: illustrates the mean and the standard deviation of the elevation of the corneal front surface off the BFS at the thinnest location in the base line map, elevation of the corneal front surface off the enhanced BFS at the thinnest location in the exclusion map and elevation difference of the corneal front surface at the thinnest location in the difference map .

B. Corneal back surface: Table (7), (Fig: 71&72)

- The mean elevation of the corneal back surface off the BFS at the thinnest location in the baseline map was $2.67 \pm 2.74 \mu m$ in the normal group and 23.93 ± 15.81 μm in the ectatic group.
- The mean elevation of the corneal back surface off the enhanced BFS at the thinnest location in the exclusion map was 14.04 ± 7.31 μm in the normal group and 46.88 ± 22.29 μm in the ectatic group.
- The mean elevation difference of the corneal back surface at the thinnest location in the difference map was 11.40 ± 5.48 μm in the normal group and 22.44 ± 8.94 μm in the ectatic group.

Corneal back surface elevation at the thinnest location		Normal	Ectatic
Baseline map (µm)	Mean	**2.67**	**23.93**
	S.D	**2.74**	**15.81**
Exclusion map (µm)	Mean	**14.04**	**46.88**
	S.D	**7.31**	**22.29**
Difference map (µm)	Mean	**11.40**	**22.44**
	S.D	**5.48**	**8.94**

Table (7): Illustrating the mean and the standard deviation of the elevation of the corneal back surface off the BFS at the thinnest location in the baseline map, exclusion map and the difference map .
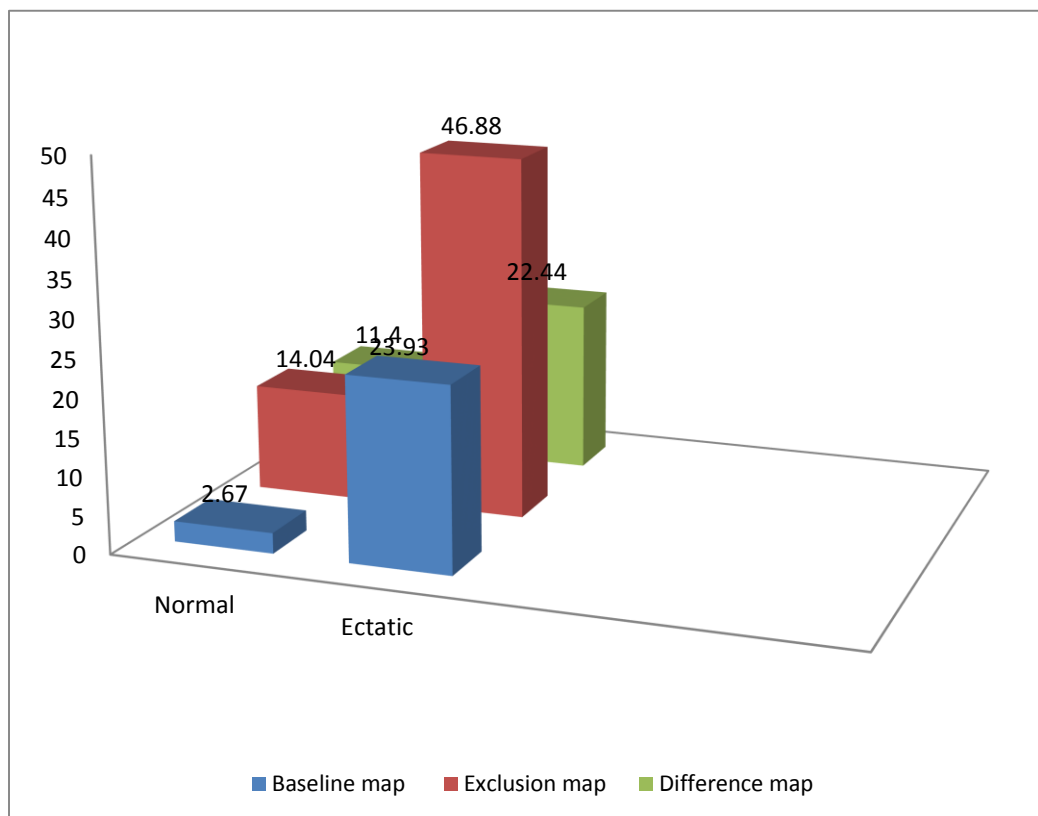
Fig.75: Illustrating the mean and the standard deviation of the elevation of the corneal back surface off the BFS at the thinnest location in the baseline map, exclusion map and the difference map .