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*Netherlands, Veldhoven,*
*NH De Koningshof, Baroniezaal*

**Impact of scleral lens wear on IOP in a population of irregular cornea patients**

*Langis Michaud, Steven Balourdet, Dan Samaha*

**Purpose**: The study will aim to to determine whether wearing scleral lenses produces anatomical changes at the optic nerve head and particularly at the Bruch's membrane opening minimum rim width (BMO-MRW) in participants with irregular corneas

**Method**: 12 participants diagnosed with irregular cornea at U de M contact lens clinic and fitted with scleral lenses were recruited. The fit of the scleral lenses was validated by OCT and slit lamp to avoid any compression. Clinical tests included measurement of ocular biomechanics (Corvis, Oculus) and an OCT scan of the optic nerve (Heidelberg Spectralis). The participant was to be seen at 2-hour intervals for 6 hours. A first series of measurements was carried out without lens wear, followed by a second day with lens wear at the same time of the day.. Bruch's membrane aperture was analyzed using OCT calipers.

**Results**: Participants were 35 years old in average. Baseline IOP was 13,74 ± 2,71 mmHg (95% IC, 12,49-14,99). Pachymetry at the thinnest point was 437,7 ± 66,26 µm (95% IC, 307,55-567,85). K max was 63,05 ± 13,65 ð (95% IC, 48,46-77,64). Corvis Biomechanical Index was de 0,95 ± 0,09 (95% IC, 0,94-0,96). Central tear fluid reservoir was 264,9 ± 56,87 µm (95% IC, 141,63-388,17) at T0 and 209,5 ± 52,98 µm (95% IC, 89,18 – 329,82) after 6h00. Without lenses, BMO-MRW was 367,2 ± 49,92 µm (95% IC, 286,53-447,86) at baseline, and lowered by 4,8 ± 3,39 µm after 6h00. This difference was not significant. Just before scleral lens application, T0 =367,7 ± 59,83 µm (95% IC, 251,89-483,51) - not different than without lenses. However, after 6h00 of lens wear BMO-MRW is significantly reduced by 7.650 +2.604. This diffrence is considered significant. BMO-MRW tends to decrease ina linear fashion, by approximately 0.61 mm per mm Hg increase in
IOP. This means that variation observed here is equivalent to a rise of 12 mm Hg in average.

**Conclusions**: This study confirms that scleral lens wear can induce an increase in IOP after 6h00 of wear. The variation observed in the irregular cornea population exceeds that observed in a normal cornea group.

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