Clinical study in a young population of the effect of contact lenses on meibomians gland dysfunction (MGD)

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ABSTRACT

Purpose:

This clinical study recorded the meibomian glands integrity and the possible score-loss in a young population wearing contact lenses. There was also a comparison between contact lens and non-contact lenses wears. The upper and lower eyelid were examined by using a corneal topographer CSO Modi 2. The research was carried out at the University of West Attica from January to June 2019.

Method:

80 volunteers participated, all the subjects selected had no obvious ophthalmological symptoms, aged 19 to 22 years (mean age 20.9 ±1,1 years). From the total of 80 subjects, 40 were contact lens users, while the remaining 40 weren't. Subjects with history of allergies, ocular or systemic disease, users of eye- drops for any reason were excluded. The images were analyzed with Phoenix software. The area of loss was measured by identifying the missing meibomian gland area and its relation to the total area expressed as an MGL percentage. For each eyelid (upper and lower) we had therefore (meiboscore) results as follows:
Grade 0 when we had no loss
Grade 1 when the loss was less than 35%,
Grade 2 when the loss was from 35% to 67% and
Grade 3 when the loss was greater than 67%.

Results:

The correlation of meiboscore with years of contact lens was presented. We observe that there seems to be a small but positive correlation, as the total period of contact lenses increases, and meiboscore increases. In addition, cumulative frequency % showed this slight increase in meiboscore, as well as increased contact lens use time. It is noteworthy that about 38% of subjects wearing contact lenses showed meiboscore 1 after their first year of use, with a likely upward trend. Concerning MGL, Paired T-tests were conducted in comparison of meiboscore with and without contact lens wear. Without CL the statistics were Arithmetic mean: 1,23 MGL – 95% Confidence for the mean: 1,03 to 1,43 – Variance: 0,6585, Standard deviation: 0,8115 - Standard error of mean: 0,1014. With C.L. the statistics were Arithmetic mean: 2,53 MGL – 95% Confidence for the mean: 1,98 to 3,08 – Variance: 4,8562, Standard deviation: 2,2037 - Standard error of mean: 0,2735. Paired T-tests between the two population, showed the Mean difference in MGL is 1,2969, Standard deviation of differences: 1,5500 - Standard error of mean differences: 0,1938

Conclusion:

We observed, that while people who did not wear contact lenses had MGL near the 5% range, MGL ranged from about 10% to 31% for C.L. users. In addition, it seems that as the total time of wearing contact lenses increased, MGL as well as meiboscore increased.

Comparison of Central Corneal Thickness Measurements between Angiovue Optical Coherence Tomography, Ultrasound Pachymetry and Ocular Biometry

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ABSTRACT

Purpose:

To compare central corneal thickness (CCT) measurements and their reproducibility when taken by Ultrasound Pachymetry, Ocular Biometry and Angiovue Optical Coherence Tomography (OCT).

Methods:

Twenty-five healthy volunteers were recruited creating a sample size of 50 eyes. All subjects had pachymetric measurements by Ultrasound pachymetry (PachPen Handheld Pachymeter, Keeler Instruments Inc), Ocular biometry (IOL Master 700 Swept Source Biometry, Zeiss) and Angiovue Optical Coherence Tomography (Optovue Avanti RTVue XR Angiovue). The measurements of central corneal thickness for the three devices were taken by the same examiner twice for more accuracy.

Results:

The average measurements of central corneal thickness by Ultrasound pachymetry (PachPen Handheld Pachymeter, Keeler Instruments Inc), Ocular biometry (IOL Master 700 Swept Source Biometry, Zeiss) and Angiovue Optical Coherence Tomography (Optovue Avanti RTVue XR Angiovue) were 547.26 μm, 551.36 μm, and 536.42 μm, respectively. The mean standard deviation (SD) of repeated measurements by Ocular biometry was 48.87 μm, which was greater than the mean SD of 44.24 μm and 40.35 μm ($P < 0.001$) by ultrasound pachymetry and Angiovue optical coherence tomography, respectively. There were statistically significant differences in the measurement results among the 3 methods (Ultrasound pachymetry vs. Ocular biometry $P = 0.019$; Ultrasound pachymetry vs. Angiovue Optical Coherence Tomography; $P < 0.001$; Ocular biometry vs. Angiovue Optical Coherence Tomography $P < 0.001$). There was a significant linear correlation between the Ultrasound pachymetry and Ocular biometry ($r = 0.945$, $P<0.001$), Ultrasound pachymetry and Angiovue Optical Coherence Tomography ($r = 0.895$, $P<0.001$), and Ocular biometry and Angiovue Optical Coherence Tomography ($r = 0.902$, $P<0.001$). Conclusion: Central corneal thickness readings were comparable between PachPen Handheld Pachymeter, IOL Master 700 Biometry and Angiovue Optical Coherence Tomography; Angiovue optical coherence tomography gave significantly smaller values. The measurements of the 3 methods showed significant linear correlations with one another. All methods provided acceptable repeatability of measurements.

The Effect of Special Yellow Filters use on Automated Static Perimeter of Normal Individuals

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ABSTRACT

Purpose

To assess the effect of two special Essilor yellow filters use (KIROS 1-400 & LUMIOR 1-400), in the visual field (VF) performance of healthy subjects. Both these filters are category 1 - indoors (VLT 46% –79%).

Materials&Methods

Twenty-five healthy individuals (25 eyes), age 31.92 ± 8.7 y.o, (11 male & 14 female) without any systemic or ocular disease), were included in the study. All patients had intraocular pressure (IOP) less than 21 mmHg, normal biomicroscopy, and clear crystalline lens. All subjects underwent a series of three VF tests with the Humphrey automated static perimetry (HFA II 740, Carl Zeiss Meditec). In a random fashion, static perimetry and VF testing was performed: (a) with non-filter, (b) with the yellow filter KIROS_1 (Essilor) & (c) with the yellow filter LUMIOR_1 (Essilor). The impact of the two yellow filters use on common VF indices such as MD, PSD and VFI was assessed, and compared to VFs without the use of special yellow filters.

Results

Statistically significant correlations ($p = 0.000$) of the MD indices, were observed between all three pairs (MD & MD KIROS_1, MD & MD LUMIOR_1, MD KIROS_1 & MD LUMIOR_1). For the PSD index, significant correlation ($p = 0.01$) was observed between the PSD (no filter) & PSD KIROS_1 groups. For the VFI index, correlation was observed between pairs ($p = 0.012$ & 0.005) except for the VFI (no filter) & VFI_LUMIOR_1 pair.

Conclusions

No statistically significant intra-observer differences were seen in the automated static perimetry indices (MD, PSD, VFI) using Essilor's category 1 yellow lenses (KIROS_1 & LUMIOR_1), as compared to no filter use.

Topographic keratoconus incidence in screening of 100 random students 15-25 years of age in Greece

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ABSTRACT

Purpose:

Scheimpflug tomography integral part of assessment in even asymptomatic keratoconus diagnosis in puberty and young adulthood in Greece.

Methods:

100 consecutive random high school and college students underwent Scheimpflug tomography to evaluate the topographic incidence of keratoconus as classified by the Pentacam HR (stages 1 to 4) as well as keratoconus suspicion based on irregular pachymetry distribution, astigmatism truncation and/or irregularity. We formed 4 groups: A: keratoconus, B: keratoconus suspects, C: regular corneas and D: irregular, not keratoconus-related corneas. All tomography maps were evaluated by 5 different evaluators (2 ophthalmic surgeons and 3 optometrists).

Results:

Mean age 21 (15-25), 60% female, 40% male. 2 or 2% were included in group A, , 28 0r 28% in group B. 67 or 67%in group C and final 3 or 3% in group D. No disagreement between the 5 evaluators for cases in group A, C and D, little variance for cases included in group B (<5%). Conclusions: These data support very high asymptomatic incidence of keratoconus suspects identified in young Greeks. These data support screening for the disease among the Greek population, especially in puberty and careful screening when laser vision correction is considered.