A- A+

Assessment of corneal scattering using Purkinje images

View Session   View Presentation

Add to Schedule   Print Abstract

Posterboard#: C0098

Abstract Number: 5811 - C0098

AuthorBlock: *Pau Santos[1], Juan A. Martínez-Roda[1], Juan C. Ondategui[1], Jorge Cazal[2], Maria Ballesta[1], Fernando Díaz-Doutón[1], Jaume Pujol[1], Meritxell Vilaseca[1]*
[1]Centre for Sensors, Instruments and Sensors Development (CD6), Universitat Politècnica de Catalunya (UPC), Barcelona, Spain; [2]Hospital CIMA Barcelona, Barcelona, Spain;

DisclosureBlock: Pau Santos, Visiometrics S.L. Code E (Employment) , Juan A. Martínez-Roda, None; Juan C. Ondategui, None; Jorge Cazal, None; Maria Ballesta, None; Fernando Díaz-Doutón, None; Jaume Pujol, None; Meritxell Vilaseca, None;

Purpose
To assess corneal scattering using a novel technique based on measuring the contrast of the third (P3) Purkinje image, which accounts for the scattering of the cornea and anterior chamber.

Methods
Corneal scattering was assessed measuring the contrast of P3, of a 2-fringes pattern aperture. Intraocular scattering was also measured using commercial systems: Objective Scatter Index (OSI) (HD Analyzer, Visiometrics SL, Spain), corneal densitometry (Pentacam, Oculus Optikgeräte GmbH, Germany) and Log(S) (CQuant, Oculus Optikgeräte GmbH, Germany). We carried out a preliminary study including 4 naked eyes of healthy patients (aged 21 to 28 years) as well as wearing contact lenses (CL) with several degrees of scattering (9mm SFX, Cataract, USA): low (L), medium (M), high (H) and very high (VH). Then, we conducted a study at the University Vision Center (CUV) of the Universitat Politecnica de Catalunya (UPC) (Terrassa, Spain) and at CIMA Sanitas Hospital (Barcelona, Spain), including 11 eyes of patients (aged 24 to 65 years) with corneal disorders (CD) such as keratitis, cornea Verticillata, Fuchs dystrophy and complications from laser (Femto-Lasik) refractive surgery. 17 eyes of healthy patients (aged 29 to 52 years) were used as control group (C).

Results
In eyes with CLs of different degree of scattering the mean P3 contrast (±SD) was of 0.53±0.04 (naked), 0.49±0.05 (L), 0.40±0.09 (M), 0.35±0.07 (H) and 0.28±0.11 (VH). Log(S) (±SD) values were 0.82±0.1 (naked), 1.27±0.21 (L), 1.98±0.04 (M), 1.99±0.13 (H) and 2.10±0.17 (VH). OSI (±SD) values were 0.43±0.16 (naked), 0.62±0.38 (L), 0.64±0.23 (M), 1.14±1.17 (H) and 1.22±1.36 (VH). Densitometry values couldn't be assessed in eyes with CLs due to internal reflections.
In the eyes of the control group and CD the P3 contrast (±SD) was 0.52±0.07 (C) and 0.44±0.11 (CD); Log(S) (±SD) values were 0.89±0.13 (C) and 1.29±0.23 (CD); OSI (±SD) values were 0.55±0.26 (C) and 2.47±1.69 (CD); and densitometry(±SD) values were 30.28±1.64 (C) and 34.37±3.78 (CD).
We found significant differences in P3 contrast between eyes from the control group and CD (t-test p=0.005). Log(S), OSI and densitometry p-values were <0.001, 0.011 and 0.004, respectively.

Conclusions
The results show the usefulness of measuring the contrast of P3 image to assess corneal scattering. Future work will focus on the possibility of discriminating corneal and lens scattering comparing the contrast of P3 and P4 images.

Layman Abstract (optional): Provide a 50-200 word description of your work that non-scientists can understand. Describe the big picture and the implications of your findings, not the study itself and the associated details.