

## Variações diurnas dos parâmetros biomecânicos da córnea e PIO medidos com o Ocular Response Analyzer

González-Méijome JM<sup>1</sup>, Queirós A<sup>1</sup>, Jorge J1, Diaz-Rey<sup>1</sup>, A, Parafita MA<sup>2</sup>

<sup>1</sup> Departamento de Física (Optometria), Escola de Ciências, Universidade do Minho, Braga, Portugal;

<sup>2</sup> Departamento de Cirurgia (Oftalmologia, Escola de Óptica e Optometria. Universidade de Santiago de Compostela. Espanha

**Objectivo:** Avaliar as variações diurnas da pressão intra-ocular (PIO) e as propriedades biomecânicas da córnea in vivo com o Ocular Response Analyzer (ORA) durante um período de tempo correspondente ao horário de actividade na clínica.

**Método:** Usando o ORA mediu-se o olho direito de 58 indivíduos com uma hora de intervalo desde as 9.00 até às 19.00 horas. 14 indivíduos eram do sexo masculino e 44 do sexo feminino com uma idade média (média  $\pm$  dp) de  $25 \pm 6$  anos variando entre os 19 e os 45 anos.

**Resultados:** As variações diurnas da PIO e das propriedades biomecânicas da córnea não são estatisticamente significativas. A diferença máxima obtida para a histerese corneal foi de 0,4 mmHg entre as 9.00 e as 19.00, enquanto que a variação máxima para PIO foi de 1,6 mmHg para o PIOcc e de 1,7 mmHg para a PIOg. Durante a tarde foram encontrados valores de PIO mais baixos e mais uniformes. Foram encontradas diferenças estatisticamente significativas entre o valor máximo, mínimo e médio PIOg, PIOcc, CRF e CH e as outras medidas realizadas durante o restante período do dia. As variações diurnas do PIOg e PIOcc estão correlacionadas de forma significativa com as variações diurnas da CH e da CRF. As variações do PIOcc correlacionam-se fortemente com as variações da CH para todas as medidas ao longo do dia ( $r > 0.500$ ;  $p < 0.001$ ).

**Conclusões:** Este estudo fornece o perfil das variações diurnas da pressão intra-ocular e das propriedades biomecânicas da córnea com uma hora de intervalo. O valor mais alto da histerese e da resistência corneal é no início da manhã e à tarde, sendo mais estáveis entre as 13.00 e as 18.00 horas. Apresentando também neste período de tempo um comportamento mais uniforme da PIO. As alterações das propriedades biomecânicas da córnea reflectem-se nas variações diurnas da PIO, sendo no entanto, diferentes a influência da CRF e da CH.

## Diurnal variations in corneal biomechanical parameters and IOP measured with Ocular Response Analyzer

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<sup>1</sup> Department of Physics (Optometry), School of Sciences, University of Minho, Braga, Portugal;

<sup>2</sup> Department of Surgery (Ophthalmology, School of Optics and Optometry. University of Santiago de Compostela. Spain

**Purpose:** To evaluate the diurnal variations of the intraocular pressure (IOP) and in vivo biomechanical properties of the cornea with the Ocular Response Analyzer (ORA) during the clinical hours.

**Methods:** The right eyes of 58 individuals were measured at one hour intervals from 9:00 until 19:00 with the Ocular Response Analyzer. Of them, 14 were males and 44 were females with ages ranging from 19 to 45 years (average  $\pm$  SD,  $25 \pm 6$  years).

**Results:** Diurnal variations of IOP and corneal biomechanical parameters were not statistically significant. The maximum difference in corneal hysteresis was 0.4 mmHg between 9:00 and 19:00, while the maximum IOP changes were 1.6 mmHg for PIOcc and 1.7 mmHg for IOpg. Lower and more uniform values of IOP were found during the afternoon. Significant differences were found between the maximum and minimum average IOpg, IOpcc, CRF and CH with other measurements taken during the day. Diurnal variations of IOpg and IOpcc were significantly correlated with diurnal variations in CH or CRF. Diurnal changes in IOpcc were strongly correlated with diurnal changes in CH for all measurement times ( $r > 0.500$ ;  $p < 0.001$ ).

**Conclusions:** The present study provides the diurnal variations' profile of the intraocular pressure and the cornea's biomechanical properties with 1 hour resolution. The highest values of corneal hysteresis and resistance to stretching and

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<sup>1</sup> Department of Physics (Optometry), School of Sciences, University of Minho, Braga, Portugal;

<sup>2</sup> School of Optics and Optometry. University of Santiago de Compostela.

Diurnal variations of the intraocular pressure (IOP) and in vivo biomechanical properties of the cornea with the Ocular Response Analyzer (ORA) during the clinical hours. The period during which these properties are more stable is during the afternoon between 13:00 and 18:00, when the IOP and the cornea's biomechanical properties display a rather uniform behavior. Changes in biomechanical parameters seem to be reflected in the diurnal changes in IOP, although the influence of CRF and CH is different.

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