Physiological diurnal variability and characteristics of the ocular pulse amplitude (OPA) with the dynamic contour tonometer (DCT- PASCAL®).

Gepubliceerd: 09-01-2007 Laatst bijgewerkt: 18-08-2022

To study the physiological diurnal variability of the OPA and its correlations with other biophysical parameters.

Ethische beoordeling	Niet van toepassing
Status	Werving gestopt
Type aandoening	-
Onderzoekstype	Interventie onderzoek

Samenvatting

ID

NL-OMON29221

Bron
NTR

Verkorte titel
Intraocular pressure, dynamic contour tonometry, ocular pulse amplitude.

Aandoening

3 intraocular measurements in the same day with two different tonometers in a group of healthy participants.

Ondersteuning

Primaire sponsor: Department of Ophthalmology
Clinique université St. Luc, UCL
Ave. Hippocrate 10
1100 Brussel

Overige ondersteuning: N/A

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

We found that the OPA remained constant during the usual outpatient office hours with a negligible inter-measurement variability.

Toelichting onderzoek

Achtergrond van het onderzoek

Purpose:

The Pascal Dynamic Contour Tonometer (DCT) allows measuring of the intraocular pressure (IOP) independently of corneal properties. It records simultaneously the haemodynamic IOP fluctuations and the difference between the systolic and the diastolic IOP corresponding to the Ocular Pulse Amplitude (OPA). The OPA indirectly reflects the choroidal perfusion and could be considered as an independent risk factor in glaucoma.

We aimed to establish the physiological diurnal variability of the OPA and its correlations with other biophysical parameters because its characteristics remain partly unclear.

Method:

Prospective randomized study including 52 eyes of 28 normal subjects with Goldmann Applanation Tonometry (GAT) IOPs <22 mmHg. Subjects treated by systemic medications that could interfere with blood pressure or heart rate were excluded. IOP was measured at 9:00 am, 1:00 pm and 4:00 pm by GAT and DCT. 2 consecutive GAT followed by 3 consecutive DCT measurements were performed on each session by the same clinician (SP). Only DCT measurements with quality 1 and 2 were taken into account. Blood pressure, pulse rate and central corneal thickness (CCT) were recorded after the last IOP measurements.

Spearman correlation coefficient was used for correlations assessment.

Results:

Mean age was 40 ± 14 years. Mean DCT values were significantly higher than GAT readings (mean=16.8+2.0 vs 15.2+2.8 mmHg, p<0.02).

The mean OPA was 2.2± 0.7 mmHg (range: 1 to 3.4 mm Hg). The mean amplitude of diurnal OPA fluctuations was 0.4 mmHg. There was no significant difference in the mean OPA values at each time of the diurnal curve. The intraclass correlation (ICC) of only one OPA measurement in relation to part of total variance due to inter-measurement variation was 78%. Averaging over three independent readings of OPA improved ICC to 91%.

The OPA was correlated with GAT (r=0.31 P<0.0001) and DCT IOP measurements (r=0.49 P <0.0001). It was correlated neither with blood pressure nor with age. OPA values of both eyes of the same individual were highly correlated (r=0.89, p<0.0001).

Conclusion:

In normal healthy eyes, the ocular pulse amplitude remains stable during the usual outpatient office hours and was not correlated with blood pressure or age of patients.

Doel van het onderzoek

To study the physiological diurnal variability of the OPA and its correlations with other biophysical parameters.

Onderzoeksopzet

N/A

Onderzoeksproduct en/of interventie

A prospective study including fifty two eyes of twenty eight healthy subjects (15 female, 13 male) with GAT IOP measurements lower than 22 mmHg. The oral consent was obtained from each patient. The IOP measurements by dynamic contour tonometer (SMT Swiss Microtechnology, Switzerland) were performed under topical anaesthesia (oxybuprocaine hydrochloride 0.4mg/ml, Thea Pharma).

The same experienced ophthalmologist performed all the examinations in a non masked fashion. The measurements were taken on the same day at 9:00 am, 1:00 pm and 4:00 pm. To reduce biases due to prior knowledge of the IOP, the examinations were performed as per this following pattern: two consecutive GAT followed by three consecutive DCT IOP measurements(Results are digitaly shown).
A 10 minute break was taken between GAT and DCT to minimize a tonographic effect. Only

the DCT measurements with quality 1 and 2 were taken into account.

The CCT, the blood pressure (BP) and pulse rate were recorded at 4:00 pm after the last IOP measurements with Tensoval® blood pressure meter (Hartmann AG, Heidenheim, Germany).

The CCT was measured by ultrasound pachymetry Pachette™(DGH 500 Technology, Inc, Philadelphia, PA).

The mean of five readings was considered for the measurement of CCT.

Mean IOP and OPA values were calculated for each time session.

Contactpersonen

Publiek

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen

(Inclusiecriteria)

Healthy participant with intraocular pressure lower than 22 mmHg measured by Goldmann applanation tonometry.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

1. History of previous ocular trauma, refractive or intraocular surgery and corneal surface diseases as well as contact lens wearers;

2. Corneal astigmatism higher than 3.00 diopters and/or ametropia higher than 6.00 diopters;

3. Use of systemic medications which could interfere with blood pressure or pulse rate.

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Anders
Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving gestopt
(Verwachte) startdatum:	05-01-2006
Aantal proefpersonen:	28
Type:	Werkelijke startdatum

Ethische beoordeling

Niet van toepassing

Soort:	Niet van toepassing

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL852
NTR-old	NTR866
Ander register	: N/O
ISRCTN	ISRCTN25577616

Resultaten

Samenvatting resultaten
Int Ophthalmol. 2007 Dec;27(6):357-60. Epub 2007 Oct 23.