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HUMAN PUPILLARY LIGHT REFLEX DURING AND AFTER TWOFOLD VALSALVA MANEUVER

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Purpose. The influence of the widely used test of human autonomic functions - the Valsalva maneuver (VM), on the parameters of a pupillary light reflex, were studied in nine normal volunteers (mean age 21.0 years).

Methods. The consensual pupillary reactions to light were recorded by infrared-reflecting pupillograph; the pupillogram (PG) records on the type were treated off-line by computerized system.

Results. It was demonstrated that the PG-latent time increased during beginning of the VM and normalized in the first min. after its end. Inversely, the PG-constriction time decreased during the VM and normalized not before the sixth min. of its end. Similar dynamics manifested the PG-half-redilatation-time. Some systematic and significant changes in PG-amplitude could not be demonstrated.

Conclusion. Possible interactions between the observed changes of some PG-parameters during and after VM and the prevailed parasympathetic or sympathetic activity during some phases of the VM and after its end, have been discussed.

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QUANTITATIVE ASSESSMENT OF SACCADIC EYE MOVEMENTS BY SCANNING LASER OPHTHALMOSCOPY

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Purpose: A technique for quantifying saccadic eye movements while simultaneously visualizing the ocular fundus may be helpful for characterizing functional aspects of central vision in macular disease. Therefore, a technique for quantifying saccadic eye movements from video recordings of the ocular fundus obtained by scanning laser ophthalmoscopy (SLO) was developed.

Theory: From an SLO image of the retina with the fovea in the centre, the space coordinates of an extrafoveal point can be calculated from the individually varying posterior nodal distance of the eye, its rotation centre, and the individual angular width of the SLO representation of the retina. These space coordinates correspond to the change in position of the fovea during an eye movement and may consequently be used to calculate the rotation angle of the eye.

Examinations: SLO video sequences of 45 seconds from each of ten normal persons obtained during fixation were analyzed, and the rotation angle of each saccadic eye movement from the sequence of each person were calculated. In order to assess the range of precision of the calculated estimates of ocular movement, each calculation was repeated using respectively the maximum and the minimum values of the measured input parameters.

Results: The rotation angles of saccadic eye movements had the same distribution in all normals with an overall mean of 0.36 degrees (range 0.20-1.67 degrees). The precision of the estimates of the rotation angles was 0.16 ± 0.11 degrees (mean \pm SD). This precision was independent on the absolute estimate of the rotation angle.

Conclusion: The technique is suitable for quantifying saccadic eye movements with an amplitude of more than 0.3 degrees.

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GAZE STRATEGY IN NEURO-OPHTHALMOLOGY : PRELIMINARY RESULTS IN IDIOPATHIC PARKINSON'S DISEASE.

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Purpose :

To study the oculomotor behavior in parkinsonian subjects and to assess the presence or not of lateral neglect in two conditions :

- 1- free exploration,
- 2- strategic attention.

Methods :

- Photo-oculographic-eye-movement recording (photo-oculometer of Métrouision).
- Stimuli are composed of digit sequences and different types of visual scenes.
- Different variables are considered for gaze movement analysis = stacked histograms, number of saccades and time spent in different areas of the visual field (central 10°, right 15°, left 15°).

Results :

Results of the idiopathic parkinsonian patients (n=21, 7 males, 14 females, mean age=67 y) are compared to those of a control-age-matched-group (n=13, 5 males, 8 females).

Idiopathic parkinsonian patients exhibit delayed responses for peripheral visual exploration in free-exploration (condition 1) and have the same performances as control subjects in condition 2 = strategic attention with constrained-choice responses.

Conclusions :

This method is more similar to everyday life conditions to evaluate patient's deficits and therefor appears to be a good technique to evaluate the influence of motor-rehability.

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NEURONAL CIRCUITRY INVOLVED DURING BLINK REFLEX: A DOUBLE RETROGRADE TRACING AND NEUROPHYSIOLOGICAL STUDY IN THE PRIMATE

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Purpose. The orbicularis oculi muscles (MOO) and levator palpebrae superioris muscles (MLP) act antagonistically during blinking, opening and closure of eyelids. The aim of the study was to examine the organisation of MLP-motoneurons and the afferent projections from MLP on both sides. Moreover, the reciprocal innervation of MOO and MLP was studied by evoking the blink reflex.

Methods. Retrograde double fluorescent tracing-studies from MLP were performed in cynomolgus monkeys. Fast Blue (FB) was implanted in one MLP and Diamidino Yellow (DY) in the other. Blink reflex was evoked by stimulation of the supraorbital nerve. After 3 days the monkeys were sacrificed and perfused. MLP, the ciliary (CG), trigeminal ganglion (TG) on both sides and brainstem were dissected, serial sections were made and studied microscopically.

Results. FB was seen in CCN and ophthalmic branches of TG on both sides. DY was found in CCN and the ipsilateral ophthalmic branch of TG. The distribution of labeled motoneurons was randomly and no somatotopy or lateralisation was present. Some double-labeled neurons were detected in CCN and a ophthalmic branch of TG. No labeled-neurons were seen in CG. The reciprocal innervation of MOO and MLP could be recorded during spontaneous blinking and evoked blink reflex.

Conclusions. The study reveals that CCN in the cynomolgus monkey is topographically one nucleus. Ad random distribution of FB, DY, and double-labeled neurons also indicate, that CCN operates functionally as one nucleus. The double-labeled CCN motoneurons may be involved in spontaneous blinks. NONE