

Poster presentation

Pupillometry in depressed patients

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Background

The multiple applications of pupillometry in different diseases are based on the direct relation of autonomic nervous system and its neurotransmitters (Acetylcholine and Norepinephrine) to miosis and mydriasis of the pupil. The sphincter muscle of the iris leads to miosis (neurotransmitter – Acetylcholine), while the dilator muscle leads to mydriasis (neurotransmitter – Norepinephrine).

Regarding depression, the monoamine deficiency hypothesis and specifically the deficiency of Norepinephrine in relation to the pathogenesis of the disease, has led many researchers to the study of the movements of the pupil in depressive patients.

In specific, changes in pupils reaction to light in depressive patients with melancholic features are found by Fountoulakis *et al.* [1] while Soloski *et al.* [2] report reduction in pupil diameter following instillation of tropicamide in depressive patients in relation to the increase of age.

Materials and methods

In the Laboratory of Clinical Neurophysiology of the Aristotle University of Thessaloniki, has been developed a system of recording and studying the movement of the pupil in reaction to light, with an infrared camera for recording in the dark and the ability of recording 262 frames per second. This gives us the possibility to record and analyze different parameters with the use of computers, concerning the movement of the pupil, with great accuracy (maximum velocity, maximum acceleration, reaction time, etc.)

The purpose of this research is the study of these parameters in the pupil light reflex, of 8 depressive patients with melancholic features according to DSM-IV criteria, free of pharmacological agents, in relation to age and gender matched normal control subjects.

Results

We studied 14 different parameters. It's important to focus on the decreased values of maximum velocity and maximum acceleration in redilation of the pupil, in the group of the patients comparing with those found in the group of the control subjects.

Discussion

These results confirm the monoamine hypothesis since Norepinephrine is the major neurotransmitter involved in the redilation of the pupil. Although the monoamine hypothesis is obviously an overly simplified notion about depression, it focuses attention on the three monoamine neurotransmitters systems (Norepinephrine, Dopamine, Serotonin) and its physiological functioning.

This has led to a much better understanding of the various mechanisms by which all known antidepressants act to boost neurotransmission at one or more of these three monoamine neurotransmitter systems.

References

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