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Fund “Nauka” Project Resume № 18007

“Establishment of a station for static and dynamic examination of the posterior ocular segment with large and small fundus camera”

Project leader: Prof. Silva Andonova-Atanasova, MD, PhD, DSc

Fundus fluorescein angiography is a study with great potential. It is a unique and essential tool for *in vivo* monitoring of microcirculation in patients with diseases of the retina, cardiovascular and central nervous system. Thanks to it, we judge the presence, activity and severity of often clinically unrecognizable diseases of the fundus and nervous system. Fluorescein angiography is an integral part of the follow-up of patients with severe retinal diseases such as diabetic retinopathy, while also supporting the healing process associated with laser treatment. The retinal circulation is the only one in the human body that can be observed in living subjects. It can also be used as a mirror image of the coronary circulation to diagnose, risk stratification and monitor changes in patients with hypertensive retinopathy, as well as to monitor microvasculopathy in diseases of the nervous system.

The acquisition of the cameras for static and dynamic photography of the fundus will allow for the first time in Bulgaria to carry out such important interdisciplinary studies for timely diagnosis, monitoring and treatment of many diseases of the retina, central (CNS), endocrine and cardiovascular system.

Aim: Establishment of a station for static and dynamic photographic examination of the posterior eye segment with large and small (stationary and portable) fundus camera.

The implementation of the project has the following tasks set:

1. Purchase of static and dynamic fundus cameras.
2. Training of the members of the Department of Ophthalmology and Visual Sciences, as well as the members of the Department of Nervous Diseases and Neuroscience to work with these cameras.
3. Development of programs and screening of patients with diseases of the retina and the nervous system with a portable retinal fundus camera.
4. Development of the first research projects of young scientists:

4.1. Assessment of the condition of the optic nerve in normal and pathology using a station for dynamic examination of the posterior segment of the eye. Early detection of patients with neurodegenerative diseases.

4.2. Development of a screening program for early diagnosis of diabetic retinopathy with the help of a station for dynamic examination of the posterior segment of the eye.

4.3. Development of a screening program for early diagnosis of age-related macular degeneration using a station for dynamic examination of the posterior segment of the eye.
5. Analysis and evaluation of the images of the fundus by an ophthalmologist specialized in the diagnosis and treatment of diseases of the optic nerve and retina.

Results: Early detection of patients with hypertensive, diabetic retinopathy, age-related macular degeneration, glaucoma and other socially significant neurodegenerative diseases. Those in need should be referred for further research and adequate treatment, thus reducing the risk of vision loss. A database of photos of the fundus has been created to be used for training students and graduates.

In the long run, the created infrastructure provides an opportunity for the implementation of numerous research projects, as well as the defense of dissertations of doctoral students in the field of ophthalmology, neuroophthalmology and neurology. Excellent opportunities for teaching, clinical and research work are guaranteed. The results provide the opportunity for career development of the participants in the project for the next 10 years.