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### (18F)-FDG PET in diagnosis of dementias and epilepsy

**Background:** Recent epidemiological studies reveal increasing incidence and prevalence of patients with dementia and epilepsy. Nuclear imaging techniques are modern non-invasive tools for investigation *in vivo* of the basic CNS biochemical processes and physiological functions. Positron emission tomography (PET) provides information about cerebral blood flow (CBF), permeability of blood-brain barrier (BBB), cerebral enzyme activity, as well as glucose, amino acids, and neurotransmitters metabolism. Accordingly, it is among the most useful biomarkers for evaluation of neurodegeneration in dementia. (18F)-FDG PET may uncover the disease underlying mechanisms, follow-up the progression, and predict the outcome. Also, interictal PET is used to detect the seizure onset zone and determine the lateralization of temporal lobe epilepsy, when a good concordance between MRI and EEG is missing.

**Objective:** To study the (18F)-FDG PET findings in patients with dementias and epilepsy.

**Methods:** Patients with different clinical forms of dementia, genetic and structural epilepsy, due to congenital or acquired brain lesions were included in the study. Detailed clinical examination, MRI and (18F)-FDG PET (Philips Gemini TF PET/CT) were performed.

**Results:** Decreased glucose metabolism, predominantly in the temporal and parietal regions was found in patients with Alzheimer's disease. The degree of hypometabolic disturbances correlated with the severity of the disease. In patients with diffuse Lewy body disease (18F)-FDG PET revealed metabolic changes similar to the AD abnormalities and additional hypometabolism in the regions of visual cortex. In patients with FTD zones of hypometabolism in frontal and temporal lobes were illustrated. Multiple foci of hypometabolism, corresponding to the disturbances of cerebral blood flow were shown on scans of patients with vascular dementia. Interictal (18F)-FDG PET demonstrated well-defined hypometabolic zones in accordance with the location of epileptic foci.

**Conclusion:** Based on our own notices, we suggest that (18F)-FDG PET is a useful effective method for early detection and precise diagnosis of dementias epilepsy.

### Biography

Ara Garabed Kaprelyan graduated from Higher Medical Institute of Varna in 1988. He is a Specialist in Neurology and Health Management, PhD since 2005, and Professor since 2013. Recently, he is a Chief of First Clinic of Neurology, member of Advisory Council (Neurology division) at University Multiprofile Hospital for Active Treatment "Sveta Marina", Varna. He is an expert in MS, PD, AD, epilepsy, and chronic pain at National Health Insurance Fund and Republican Consultant of Ministry of Health for North-East region of Bulgaria. He is Head of Department of Neurologic Diseases and Neurosciences at Varna Medical University. His Postgraduate education includes specialization in neuro-oncology, clinical immunology, otoneurology, clinical epileptology, and movement disorders. He has over 150 scientific publications and authorship in eight medical text-books and monographs. He is a Member of Bulgarian Society of Neurology (Board of Managers; Chairman of regional branch at Varna district), Bulgarian Association of Neuro-oncology (Vice-president), International Medical Association Bulgaria, Balkan Medical Union (Vice-president of Bulgarian branch), and EAN (scientific panels of neuroepidemiology and neuro-oncology). He is in the Editorial Board of *Journal of IMAB* and *Bulgarian Neurology*, as well as a Correspondent member of Bulgarian Academy of Sciences and Arts.

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