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Early diagnosis of dementia stages in AD with cerebral tomography morphometry

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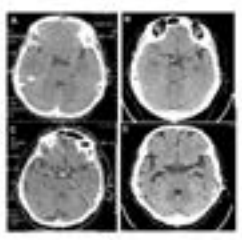
Background: To early diagnose the severity of dementia in AD, we offer the Tomography Dementia Rating scale (TDR). Based on the morphometry of CT or MRI, the scale allows to determine the percentage of severity of atrophic changes in cerebral temporal lobes and to determine the severity of dementia due to the data obtained.

Methods: The research included 1078 patients: of which 93 patients aged 34-80 with AD at various stages were taken as Test Group, 985 patients aged 28-78 with various kinds of brain lesions with dementia but without AD (moderate and severe vascular dementia, Parkinson's atherosclerosis, Binswanger's disease, Parkinson's disease) were taken as Control Group. The examination plan included CDR assessment, MMSE, cerebral CT, MRI with subsequent temporal lobes atrophy degree calculation, scintigraphy (SG), rheoencephalography (REG), and cerebral MUGA.

Results: CT and MRI among all patients with AD revealed that brain characteristic objective morphological features were temporal lobes atrophic changes of 4-62% at various AD stages. These data made it possible to make a scale allowing certain atrophic changes determination at each AD stage: • Preclinical AD stage - TDR-0: temporal lobes atrophy with 4-8% tissue mass decrease. • Early AD stage - mild dementia - TDR-1: temporal lobes atrophy with 9-18% tissue mass decrease (corresponds to CDR-1). • Average AD stage - mild dementia - TDR-2: temporal lobes atrophy with 19-32% tissue mass decrease (corresponds to CDR-2). • Late AD stage - severe dementia - TDR–3: temporal lobes atrophy with 33-62% tissue mass decrease (corresponds to CDR-3). These atrophic changes are not observed among patients with other cerebral lesions.

Conclusions: The morphologically determined scale of AD-TDR stages is an effective method for objectively determining AD stage by means of widespread CT and MRI. At the same time, this scale allows to differentiate AD from other diseases that are accompanied by the development of cerebral neurodegenerative changes complicated by dementia and cognitive impairment. The scale is easily applicable to medical institutions allowing correct and objective AD stage determination in clinical practice.



Biography

Ivan V Maksimovich, MD, PhD is a member of ISTAART, ESC, EAPCI, WSO, ESO, and EPA. He is a Head Physician of Clinic of Cardiovascular Diseases named after Most Holy John Tobolsky (Moscow, Russia) since 1993. One of the major problems the clinic deals with is the diagnosis and treatment of various brain lesions including Alzheimer's disease. Over the past 20 years, he has published over 200 scientific works on this subject.

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