Cognitive impairment prediction in patients with hypertension with Pulse Wave Velocity and arterial stiffness measurement

Varahabhatla Vamsi[a], Aitham Venkat Ratnam[a], Marina Sikorskaa[b], Ganna Gritsayc, Ingrid Prkacin[d]

[a]*Zaporozhye State Medical University, Ukraine*[b]*Department of Neurology, Zaporozhye State Medical University, Ukraine*
[c]*Department of Family Medicine, Zaporozhye State Medical University, Ukraine*
[d]*Department of Internal Medicine, Zagreb School of Medicine, Zagreb, Croatia*

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INTRODUCTION The blood supply of the brain gradually reduces with ongoing age, the cerebral cortex undergoes atrophy, causes cognitive inhibition converting to vascular dementia and Alzheimer's in later stages. The relation between cognitive impairment (CI) and high blood pressure has been long studied in elderly patients, necessitating for further research and evidence on this topic. AIM To study the parameters of arterial stiffness (AS): central blood pressure (CBP), pulse wave velocity (PWV) in patients with hypertension and determine it's relationship with vascular CI. METHODS AND MATERIALS A systematic literature review was performed using a standardised published methodology; 25 studies were selected from last 10 years from google search engine, Pubmed central and NCBI with keywords like AS, CBP, PWV, CI. RESULTS PWV was a significant and independently associated with cognitive function when measured with mini mental state examination in an elderly population in Japan. The relationship between high vascular stiffness and CI is explained as the disturbance in regulation of endothelial nitric oxide release. This in turn causes a neuronal energy crisis initiated by cerebral hypoperfusion due to impaired vascular tone and develops CI. As elderly population tend to have an increased risk for arteriosclerosis which is highly predicted by PWV, these patients are highly prone to develop vascular dementia and Alzheimer's in future. CONCLUSION An inverse relation between AS and cognitive function was found and provided an evidence to vascular hypothesis of vascular dementia and Alzheimer's. Prospective studies involving these early predictive markers PWV and AS may help in therapeutic intervention and progression of the disease.