

3rd International Conference and Exhibition on **Neurology & Therapeutics**

September 08-10, 2014 Hilton Philadelphia Airport, USA

Transcranial doppler ultrasonography: A method of evaluating cognitively impaired and non-cognitively impaired elderly

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Objective: The purpose of this study was to investigate and compare the cerebral hemodynamic status (blood flow velocity and pulsatility index) of cognitively impaired and non-cognitively impaired elderly using Transcranial Doppler (TCD). Specifically, it aimed to determine if TCD can be a biomarker for patients with cognitive impairment.

Methods: This is a cross sectional study conducted in Jose R. Reyes Memorial Medical Center (JRRMMC) Neurology OPD. Forty patients were selected using convenience sampling and were screened using the Montreal Cognitive Assessment-Philippines (MoCA-P). Scores ≥ 21 were grouped under non-cognitively impaired elderly while scores < 21 were under cognitively impaired elderly. Transcranial ultrasound basal examination were performed using a 2-MHz power motion probe (M-mode) to study the middle cerebral artery (MCA), the anterior circulation artery (ACA) and posterior cerebral artery (PCA).

Results: Our findings showed that patients with cognitive impairment have lower mean flow velocity (MFV) (p value=0.0001) and higher pulsatility index (PI) (p value=0.0001) when compared to non-cognitively impaired elderly. Reduction in MFV and increase in PI in the cognitively impaired group may be related to microvessel damage brought about by hypertension, diabetes mellitus and smoking.

Conclusion: Cognitively impaired elderly has significantly higher PI and lower MFV compared to normal elderly. TCD can be a biomarker for screening patients with cognitive impairment.

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