KORELASI RASIO VOLUME HIPOKAMPUS TERHADAP *TOTAL INTRACRANIAL VOLUME* BERDASARKAN *MAGNETIC RESONANCE IMAGING* DENGAN SKOR *MONTREAL COGNITIVE ASSESSMENT* VERSI INDONESIA PADA PASIEN DEMENSIA ALZHEIMER

Bondan Dananjoyo[1], Arif Faisal[2], Sri Retna Dwidanarti[2], Retno Sutomo[1] , Bambang Supriyadi[2] , Anita Ekowati[2]

[1]Program Studi Magister Ilmu Kedokteran Klinis dan [2]Departemen Radiologi, FK-KMK, Universitas Gadjah Mada, Daerah Istimewa Yogyakarta-Indonesia

INTISARI

Latar Belakang: Demensia Alzheimer ditandai oleh atrofi hipokampus yang berhubungan dengan penurunan fungsi kognitif. Rasio volume hipokampus terhadap total volume intrakranial (HV/TIV) dinilai sebagai indikator struktural yang stabil terhadap atrofi, sedangkan skor Montreal Cognitive Assessment versi Indonesia (MoCA-INA) digunakan untuk mengukur fungsi kognitif secara menyeluruh.

Tujuan: Menilai korelasi antara rasio HV/TIV dengan skor MoCA-INA pada pasien dengan demensia Alzheimer.

Metode: Penelitian *cross sectional* retrospektif dilakukan pada 41 pasien demensia Alzheimer yang menjalani MRI volumetrik otak di RS Sardjito Yogyakarta antara Januari 2023 hingga Desember 2024. Rasio HV/TIV dihitung dari hasil MRI volumetrik, sedangkan skor MoCA-INA diperoleh dari asesmen kognitif. Uji korelasi Spearman digunakan untuk mengevaluasi hubungan antar variabel.

Hasil: Ditemukan korelasi positif yang bermakna antara rasio HV/TIV dan skor MoCA-INA ($r = 0,362$; $p = 0,020$), menunjukkan bahwa peningkatan rasio HV/TIV berhubungan dengan peningkatan skor MoCA-INA.

Kesimpulan: Rerata rasio HV/TIV pada populasi penelitian ini adalah 0,439% (± 0,013). Terdapat korelasi positif yang signifikan antara rasio HV/TIV dan skor MoCA-INA. Rasio HV/TIV dapat digunakan sebagai indikator kuantitatif untuk menilai derajat gangguan kognitif, serta memiliki potensi sebagai biomarker struktural untuk deteksi dini risiko progresi Alzheimer.

Kata kunci: Alzheimer, hipokampus, HV/TIV, MoCA-INA, MRI otak

Correlation Between Hippocampal Volume to Total Intracranial Volume Ratio Based on Magnetic Resonance Imaging and Indonesian Version of Montreal Cognitive Assessment Score in Patients with Alzheimer's Dementia

Bondan Dananjoyo[1], Arif Faisal[2], Sri Retna Dwidanarti[2], Retno Sutomo[1], Bambang Supriyadi[2], Anita Ekowati[2]

[1]Master Program in Clinical Medicine and [2]Department of Radiology, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, Special Region of Yogyakarta, Indonesia

ABSTRACT

Background: Alzheimer's dementia is characterized by hippocampal atrophy associated with cognitive decline. The hippocampal volume to total intracranial volume ratio (HV/TIV) is considered a stable structural marker of atrophy, while the Indonesian version of the Montreal Cognitive Assessment (MoCA-INA) is used to assess cognitive function.

Objective: To evaluate the correlation between the HV/TIV ratio and MoCA-INA scores in patients with Alzheimer's dementia.

Methods: This retrospective cross-sectional study included 41 patients with clinically diagnosed Alzheimer's dementia who underwent brain volumetric MRI at Sardjito Hospital between January 2023 and December 2024. The HV/TIV ratio was obtained from volumetric MRI analysis, and MoCA-INA scores were collected from cognitive assessments. Spearman correlation analysis was used to evaluate the relationship between the variables.

Results: A significant positive correlation was found between HV/TIV ratio and MoCA-INA score ($r = 0.362$; $p = 0.020$), indicating that a higher HV/TIV ratio is associated with better cognitive performance.

Conclusion: The mean HV/TIV ratio in this study population was 0.439% (± 0.013). There is a significant positive correlation between the HV/TIV ratio and MoCA-INA scores. The HV/TIV ratio may serve as a quantitative indicator for assessing the degree of cognitive impairment and holds potential as a structural biomarker for the early detection of Alzheimer's disease progression risk.

Keywords: Alzheimer's disease, hippocampus, HV/TIV, MoCA-INA, brain MRI