

KORELASI PERFUSI REGIONAL AREA FRONTAL MRI *ARTERIAL SPIN LABELING* DENGAN FUNGSI KOGNITIF DEMENSIA VASKULAR PASCA STROKE

Diba Anindhita Nandawardhani*, Amelia Nur Vidyanti**, Yudiyanta**

*Residen Neurologi, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan, Universitas Gadjah Mada

**Staf Departemen Neurologi, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan, Universitas Gadjah Mada

INTISARI

Latar Belakang: Demensia vaskular merupakan gangguan kognitif akibat lesi vaskular otak, merupakan tipe demensia kedua terbanyak setelah Alzheimer, dengan prevalensi tinggi di Asia termasuk Indonesia. Pasca-stroke, insiden demensia vaskular meningkat hingga 34%, disebabkan oleh hipoperfusi kronis pada regio frontal yang memengaruhi fungsi eksekutif. MRI dengan *Arterial Spin Labeling* (ASL) memungkinkan pengukuran non-invasif perfusi serebral tanpa bahan kontras, mulai banyak digunakan pada kasus demensia, namun korelasi dengan fungsi kognitif pasien demensia vascular pasca stroke masih inkonsisten.

Tujuan: Mengetahui korelasi perfusi regional area frontal berdasarkan MRI ASL dengan fungsi kognitif pada pasien demensia vaskular pasca-stroke.

Metode: Studi potong lintang pada 32 pasien demensia vaskular pasca-stroke yang memenuhi kriteria *probable* NINDS-AIREN. Dilakukan MRI ASL menggunakan PASL semikuantitatif dengan ROI 6 area dibandingkan hemisfer kontralateral untuk menghitung *relative Cerebral Blood Flow* (rCBF) pada fase pasca-akut stroke. Asesmen fungsi kognitif dengan *Montreal Cognitive Assessment* Indonesia (MoCA-Ina). Analisis statistik mencakup korelasi Pearson dan regresi linier multivariat.

Hasil: Median dilakukan MRI yaitu 54 (14-116) hari dari onset stroke. Tidak terdapat korelasi signifikan antara rCBF frontal ($r=-0.12$, $p=0.52$) atau global dengan skor total MoCA-Ina. Prediktor independen penurunan fungsi kognitif meliputi derajat Fazekas tinggi ($\beta=-3.2$, $p=0.01$), lesi di regio temporal dan ganglia basalis ($\beta=-4.1$, $p=0.003$), gula darah sewaktu tinggi ($\beta=-2.8$, $p=0.02$), obesitas ($\beta=-3.5$, $p=0.008$), serta pendidikan rendah ($\beta=-2.9$, $p=0.015$).

Kesimpulan: Perfusi regional area frontal berdasar MRI ASL tidak berkorelasi dengan fungsi kognitif pada demensia vaskular pasca-stroke. Faktor struktural seperti derajat Fazekas, lesi temporal dan ganglia basal, hiperglikemia, obesitas, serta tingkat pendidikan rendah berperan dominan sebagai prediktor independen.

Kata kunci: demensia vaskular, MRI ASL, stroke, MoCA-INA, perfusi serebral

Korespondensi: Diba Anindhita Nandawardhani
Email: dibanindhita@gmail.com

CORRELATION OF MRI ARTERIAL SPIN LABELING FRONTAL REGIONAL PERFUSION WITH COGNITIVE FUNCTION IN POST STROKE VASCULAR DEMENTIA

Diba Anindhita Nandawardhani*, Amelia Nur Vidyanti**, Yudiyanta**

*Neurology Resident Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada

**Staff of Neurology Department, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada

ABSTRACT

Background: Vascular dementia, a cognitive impairment from cerebrovascular lesions, is the second most common dementia type after Alzheimer's, with high prevalence in Asia including Indonesia. After stroke, its incidence rises up to 34%, driven by chronic frontal hypoperfusion affecting executive function. MRI with Arterial Spin Labeling (ASL) enables non-invasive cerebral perfusion measurement without contrast and is increasingly used in dementia; however, correlation with cognitive function in post-stroke vascular dementia remains inconsistent

Objective: To determine the correlation between regional frontal perfusion on MRI ASL and cognitive function in patients with post-stroke vascular dementia.

Methods: Cross-sectional study of 32 post-stroke vascular dementia patients meeting probable NINDS-AIREN criteria. MRI ASL was performed using semiquantitative PASL with ROI in 6 areas compared to the contralateral hemisphere to calculate relative Cerebral Blood Flow (rCBF) in the post-acute stroke phase. Cognitive function was assessed using Montreal Cognitive Assessment Indonesia (MoCA-Ina). Pearson correlation and multivariate linear regression were used.

Results: Median MRI timing was 54 (14-116) days from stroke onset. No significant correlation was found between frontal rCBF ($r=-0.12$, $p=0.52$) or global rCBF and total MoCA-Ina scores. Independent predictors of cognitive decline included high Fazekas grade ($\beta=-3.2$, $p=0.01$), temporal and basal ganglia lesions ($\beta=-4.1$, $p=0.003$), high random blood glucose ($\beta=-2.8$, $p=0.02$), obesity ($\beta=-3.5$, $p=0.008$), and low education ($\beta=-2.9$, $p=0.015$).

Conclusion: Regional frontal perfusion on MRI ASL does not correlate with cognitive function in post-stroke vascular dementia. Structural factors (Fazekas grade, temporal and basal ganglia lesions), hyperglycemia, obesity, and low education level act as dominant independent predictors.

Keywords: vascular dementia, MRI ASL, stroke, MoCA-Ina, cerebral perfusion

Correspondence: Diba Anindhita Nandawardhani

Email: dibanindhita@gmail.com