Hubungan Terapi Endovaskular Terhadap Perubahan Luaran Klinis (Delta NIHSS) Pasien Stroke Iskemik Akut di RSUP dr. Kariadi Semarang (Studi Eksploratif longitudinal Kadar GFAP Serum)

Ageng Priatmaja*, Aditya Kurnianto**, Elta Diah Pasmanasari**, Dwi Pudjonarko**, Jimmy Eko Budi Hartono**, Yovita Andhitara**

*Residen Neurologi Fakultas Kedokteran Universitas Diponegoro/RSUP dr. Kariadi Semarang

**Staff Departemen Neurologi RSUP dr. Kariadi/Fakultas Kedokteran Universitas Diponegoro

ABSTRAK

Latar Belakang: Glial fibrillary acidic protein (GFAP) merupakan biomarker kerusakan astrosit yang meningkat sejak jam-jam awal stroke iskemik dan umumnya memuncak dalam 48–72 jam pasca-onset. Intervensi endovaskular pada oklusi pembuluh besar berpotensi mempercepat reperfusi dan menurunkan pelepasan GFAP.

Tujuan: Menilai (1) perbedaan perubahan skor *National Institutes of Health Stroke Scale* (ΔNIHSS) antara pasien yang menerima terapi endovaskular dan kontrol dari H3 ke H7; serta (2) hubungan antara perubahan kadar GFAP (ΔGFAP) dengan ΔNIHSS.

Metode: Kohort observasional dua kelompok pada pasien stroke iskemik akut. Pengukuran NIHSS dan GFAP dilakukan pada H3 dan H7. Luaran primer: perbedaan rerata ΔNIHSS antar kelompok. Luaran sekunder: perbedaan ΔGFAP antar kelompok dan korelasi ΔGFAP–ΔNIHSS. Analisis statistik pada uji komparatif ΔNIHSS dan ΔGFAP menggunakan uji *Independent T-test,* korelasi *ΔNIHSS–ΔGFAP* menggunakan korelasi *Pearson dan* Analisis Multivariat menggunakan *Model regresi logistik eksploratif* untuk menilai pengaruh faktor risiko terhadap perbaikan klinis (ΔNIHSS) dikotomis

Hasil: Sebanyak 40 pasien dianalisis (20 endovaskular; 20 kontrol). ΔNIHSS antar kelompok belum menunjukkan perbedaan bermakna (selisih rerata 0,4 poin; IK 95% -0,88 s.d. 1,68; p = 0,522). Terdapat hubungan kuat dan signifikan antara ΔGFAP dan ΔNIHSS (r=0,672; p=0,018). Analisis multivariat secara eksploratif menunjukkan adanya hubungan antara hipertensi dan dislipidemia dengan luaran klinis (p=0,002),

Kesimpulan: Perubahan GFAP berasosiasi dengan perubahan status neurologis dini. Temuan ini memberikan indikasi awal mengenai potensi ΔGFAP sebagai marker respons terhadap tata laksana akut. Secara eksploratif, faktor risiko seperti hipertensi dan dislipidemia tampak berkaitan dengan perbaikan klinis, namun studi ini memerlukan konfirmasi pada sampel yang lebih besar untuk mendapatkan simpulan yang lebih kuat.
Kata Kunci: stroke iskemik; GFAP; NIHSS; terapi endovaskular; biomarker.

The Relationship of Endovascular Therapy to the Change in Clinical Outcomes (Delta NIHSS) in Acute Ischemic Stroke Patients at dr. Kariadi Hospital Semarang (A Longitudinal Exploratory Study of Serum GFAP Levels)

Ageng Priatmaja*, Aditya Kurnianto**, Elta Diah Pasmanasari**, Dwi Pudjonarko**, Jimmy Eko Budi Hartono**, Yovita Andhitara**

*Neurology Resident, Faculty of Medicine, Universitas Diponegoro / dr. Kariadi General Hospital, Semarang, Indonesia

**Staff, Department of Neurology, dr. Kariadi General Hospital / Faculty of Medicine, Universitas Diponegoro, Semarang, Indonesia

ABSTRACT

Background: Glial fibrillary acidic protein (GFAP) is an astrocyte damage biomarker that increases in the early hours of ischemic stroke and generally peaks within 48–72 hours post-onset. Endovascular intervention in large vessel occlusion has the potential to accelerate reperfusion and reduce GFAP release.

Objective: To assess (1) the difference in the change in National Institutes of Health Stroke Scale (ΔNIHSS) score between patients receiving endovascular therapy and controls from day 3 (D3) to day 7 (D7); and (2) the relationship between the change in GFAP levels (ΔGFAP) and ΔNIHSS.

Methods: An observational cohort study of two groups in acute ischemic stroke patients. NIHSS and GFAP measurements were performed on D3 and D7. Primary outcome: the difference in mean ΔNIHSS between groups. Secondary outcomes: the difference in ΔGFAP between groups and the correlation of ΔGFAP–ΔNIHSS. Statistical analysis for the comparative test of ΔNIHSS and ΔGFAP was performed using the *Independent T-test*, the correlation between ΔNIHSS and ΔGFAP was analyzed using *Pearson correlation*, and multivariate analysis was conducted using an *exploratory logistic regression model* to evaluate the influence risk factors on dichotomous clinical improvement (ΔNIHSS).

Results: A total of 40 patients were analyzed (20 endovascular; 20 control). The ΔNIHSS between groups did not show a significant difference (mean difference 0.4 points; 95% CI -0.88 to 1.68; $p = 0.522$). There was a strong and significant correlation between ΔGFAP and ΔNIHSS ($r = 0.672$; $p = 0.018$). Exploratory multivariate analysis revealed that hypertension and dyslipidemia were significantly associated with clinical outcomes ($p = 0.002$).

Conclusion: Changes in GFAP levels are associated with early neurological status changes. These findings provide an initial indication of the potential of **ΔGFAP** as a marker of response to acute management. Exploratory analysis suggests that risk factors such as hypertension and dyslipidemia appear to be related to clinical improvement; however, this study requires confirmation with a larger sample size to achieve more robust conclusions
Keywords: ischemic stroke; GFAP; NIHSS; endovascular therapy; biomarker.