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The Relationship of Blood Parameter Routine, serum level of homocysteine and Long Term Ischaemic Stroke Outcome

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Abstract: Background and Purpose: Homocysteine (Hcy) is considered as one of the factors affecting the prognosis of ischaemic stroke. Homocysteine is an amino acid containing sulfhydryl and needs vitamin B6, B12, folic acid and betaine for the metabolism. This amino acid has a pre-oxidative and pre-inflammatory effect and induces the progression of vasoconstriction, disturbance of structure and function of endothelium and atherosclerosis. It also acts as a prethrombotic factor with increasing coagulability and platelets aggregation. Hyperhomocysteinemia (HHcy) is an acquired metabolic anomaly and leads to cardiovascular and cerebrovascular complications like atherosclerosis, thrombosis, stroke, Alzheimer's disease, dementia and declining memory. The aim of this study is to determine the relationship between Blood Parameter Routine, homocysteine level and ischemic stroke outcome.

Method: This cross-sectional study was conducted between July 2016 and October 2016 on 36 patients with ischemic stroke, after approval by Medical Faculty Science's Ethics Committee at University Sumatera Utara. Patients with a history of ischemic stroke recurrent, brain lesion malignancy, Hemoragic stroke at the beginning or during hospitalization were excluded. Uncontrolled diabetes, anemia and dramatic blood pressure reduction in admission were defined as confounding factors. In the first week, serum level of homocysteine was measured and modified Rankin Scale (mRS) and status of patients were measured with Barthel index (BI) in the first week and three month after stroke. Data were analyzed by Chi Square, Student t-test, and ANOVA. Patients were followed for a median of 90 days.

Results: Thirty six patients were recruited in the present study (52.8% men and 47.2% women). The abnormal cut off point of plasma homocysteine was > 10.3 $\mu\text{mol/L}$. The routine blood tests done at the beginning of hospital admission compared blood homocysteine examination found no significant difference ($p > 0.05$). There was no significant difference between systolic and diastolic blood pressure against homocysteine ($p > 0.05$). Further subgroup analysis showed that this correlation was significantly between 90 days homocysteine on outcome stroke MRS ($p < 0.003$) and BI ($p < 0.005$).

Conclusion: Abnormal plasma homocysteine level is an independent risk factor of ischemic stroke and more correlated with 90 days outcome stroke.

Key words: homocysteine, hypertension, long term stroke ischemic.