

**ABSTRACT**

**ANALYSIS OF SIMVASTATIN IN SERUM TUMOR NECROSIS FACTOR  
ALPHA LEVEL IN PATIENTS WITH ACUTE ISCHEMIC STROKE  
(Study at Neurology Department of Dr. Soetomo Teaching Hospital Surabaya and  
Airlangga University Hospital Surabaya)**

**Background :** Ischemic stroke is a focal neurological deficit that caused by interruption of blood flow in the brain. The sudden blockage of blood flow to the brain causes tissue hypoxia and triggers an inflammatory cascade leading to impairment of ion homeostasis, neuronal excitotoxicity, intracellular calcium overload, free radical generation, and lipid peroxidation which will cause neuronal injury. TNF- $\alpha$  is one of the key inflammation markers that has important role in cell damage and death following stroke. In the previous studies, Simvastatin, when administered within 24 hours of the acute ischemic stroke onset, can inhibit the increase in serum TNF- $\alpha$  levels.

**Objectives :** To analyze serum TNF- $\alpha$  levels between the group of acute ischemic stroke patients who treated with Simvastatin 20 mg and the ischemic stroke patients who included in placebo group.

**Method :** This study is a clinical experimental randomized controlled trial. Data were collected between August and November 2017. Venous blood sample were obtained to extract serum TNF- $\alpha$  level before and after 5 days of intervention. Protocol of this study was approved by Ethical Committee of Dr Soetomo Teaching Hospital Surabaya and Airlangga University Hospital Surabaya. The informed consents must be signed as a proof of participation in this study. The measured data of serum TNF- $\alpha$  level were analyzed using Mann Whitney test to compare non parametric data between Simvastatin and placebo group and Wilcoxon test to compare non parametric data within group.

**Result :** Total 44 participants were include in this study divided into 22 patients in placebo group and 22 patients in Simvastatin group. Patients characteristics between two groups were not significantly different ( $p > 0.05$ ). The mean of serum TNF- $\alpha$  levels before intervention between placebo group ( $18.46 \pm 57.54$  pg/mL) and Simvastatin group ( $6.36 \pm 4.95$  pg/mL) were not significantly different ( $p > 0.05$ ). The mean of serum TNF- $\alpha$  levels after intervention between placebo group ( $8.34 \pm 7.23$  pg/mL) and Simvastatin group ( $6.52 \pm 7.35$  pg/mL) were not significantly different ( $p > 0.05$ ). The mean of serum TNF- $\alpha$  level in placebo group decrease with  $p > 0.05$ , while in Simvastatin group the mean of serum TNF- $\alpha$  increase with  $p > 0.05$ .

**Conclusion :** Administration of Simvastatin could not decrease the serum TNF- $\alpha$  level in acute ischemic stroke.

**Keyword :** Acute Ischemic Stroke, TNF- $\alpha$ , Simvastatin