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THE EFFECT OF VITAMIN A AND D COMBINATION SUPPLEMENTATION ON CLINICAL OUTCOME IN ISCHEMIC STROKE PATIENTS

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Background: Stroke is one of the cerebrovascular diseases (CVD) which is considered as the third cause of death, after heart disease and malignancy, and is the number one cause of long-term disability worldwide. In the last decade, a number of studies have examined the relationship between serum vitamin D concentration and the risk of cerebrovascular events. The results showed that hypovitaminosis D can cause atheroma, and supplementation of vitamin D can prevent the risk of CVD. Besides vitamin D, the latest evidence shows that vitamin A is also a risk factor for cerebrovascular disease. Plasma vitamin A levels are inversely correlated to the risk of CVD mortality. Researches has shown that patients with atherosclerosis have vitamin A levels that were significantly lower than controls. Vitamin A and its derivatives act biologically via specific nuclear receptors that regulate gene transcription. Vitamin A receptors can also interact with other nuclear receptors that have neuroprotective effects such as vitamin D, against Stroke. Previous studies had only analyzed the effect of vitamin D supplementation in CVD, without combining it with vitamin A, which has synergistic effect to vitamin D.

Objective: To determine the the effect of vitamin A and D combination supplementation on clinical outcome in Ischemic Stroke Patients.

Method: This study was performed at Adam Malik General Hospital, Medan, Indonesia. The design of this study was a prospective cohort, and overall study samples were followed since the diagnosis of acute phase Ischemic Stroke was established until the clinical outcome of 8 weeks after stroke onset. All of the standard treatments for Ischemic Stroke were given equally for all subejcts, and cardioembolic Stroke was excluded. Stroke severity and clinical outcome were determined using the National Institute of Health Stroke Scale (NIHSS). Subjects who met the inclusion criteria would be divided into treatment and placebo group. Treatment group were given supplementation of combination of vitamin A 50.000 IU and vitamin D 50.000 IU. After 8 weeks, all subjects were assessed for NIHSS as clinical outcome.

Results: From total of 40 research subjects, the mean of serum vitamin A and D level on admission were 422,90 ± 246,78 μg/L and 19,71 ± 7,15 ng/mL respectively for the treatment group. As for the placebo group, the mean of serum vitamin A and D level were 493,80 ± 273,49 μg/L and 24,69 ± 7,41 ng/mL respectively on admission. Meanwhile, the mean of NIHSS on admission for the treatment group was 13,25 ± 1,61 and 13,15 ± 1,39 for the placebo group. After supplementation, in the treatment group, the mean of vitamin A increased significantly to 498,55 ± 282,45 μg/L ($p = 0.04$), as well as the mean of vitamin D increased significantly to 25,70 ± 10,39 ng/mL ($p = 0.01$). On the contrary, in the placebo group, vitamin A serum level decreased significantly to 463,95 ± 266,34 μg/L ($p = 0.04$) and also vitamin D serum level decreased to 22,62 ± 7,10 ng/mL ($p = 0.01$). As for the NIHSS, there were decrement in both treatment and placebo group, but the decrement was more in the supplementation group (mean of NIHSS 6,00 ± 1,52), when compared to the placebo group (mean of NIHSS 11,75 ± 1,29). Lower NIHSS score indicates better clinical outcome, meaning subjects in the supplementation group had a better clinical outcome, compared to the placebo group.

Conclusion: Administration of combination of vitamin A and D supplementation can significantly improve clinical outcome in Ischemic Stroke when compared to patients without supplementation.

Keywords: Ischemic Stroke, Vitamin A, Vitamin D, outcome, NIHSS

References

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