

## Role of Soluble E-Selektin, Soluble Intra Cellular Adhesion Molecule-1 (sICAM-1) and Soluble Vascular Cellular Adhesion Molecule-1 (sVCAM-1) in Overweight Children

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### ABSTRACT

**Background:** Adhesion molecule (E-selectin, ICAM-1 and VCAM-1) have a crucial role in neutrophil extravasation caused by endothelial cell activation in viral Dengue infection. In the over nutritious state, the serum adiponectin level tends to be lower which limit its ability to inhibit the expression of pro-inflammatory cytokines (TNF $\alpha$ , IL-6 and NF-kB) and adhesion molecules. There is also increased level of TNF $\alpha$ , IL-1  $\beta$ , IL-6, IL-8 which increase the expression of adhesion molecules even further.

**Objective:** The aim of this study is to determine the role of sE-selectin, sICAM-1 and sVCAM-1 in pediatric Dengue Hemorrhagic Fever (DHF) patient with overweight.

**Methods:** An analytic observational nested case-control study was conducted in Pediatric Division Sanglah General Hospital, Bali, Indonesia from January 2015 to October 2016 which DHF as a cases and Dengue Fever (DF) as a control. Diagnosis of dengue infection was according to WHO 1997.

**Results:** 80 subjects were enrolled in this study with 40 subjects for each group. The baseline characteristics between case and control showed no significant differences. This study showed that overweight increased the risk of Dengue Shock Syndrome (DSS) with odds ratio 2.67 (95% CI 0.72-9.95). The means level of sE-selectin in DHF with overweight group vs. normal weight was  $44.39 \pm 14.55$  ng/mL vs.  $53.76 \pm 22.24$  ng/mL,  $p=0.118$ ; DF group ( $57.18 \pm 23.86$  ng/mL vs.  $48.95 \pm 24.79$  ng/mL),  $p=0.350$ ; DSS group ( $42.44 \pm 9.44$  ng/mL vs.  $40.93 \pm 14.56$  ng/mL),  $p=0.810$ . Level of sICAM-1 in DHF group ( $407.25 \pm 137.54$  ng/mL vs.  $354.42 \pm 87.49$  ng/mL),  $p=0.148$ ; DF group ( $363.65 \pm 182.09$  ng/mL vs.  $359.71 \pm 146.88$  ng/mL),  $p=0.944$ ; DSS group ( $367.25 \pm 105.86$  ng/mL vs.  $313.34 \pm 68.65$  ng/mL),  $p=0.293$ . The means level of sVCAM-1 in DHF was  $5333.86 \pm 1048.18$  ng/mL vs.  $4703.90 \pm 956.64$  ng/mL,  $p=0.054$ ; DF group ( $4666.44 \pm 950.74$  ng/mL vs.  $4549.40 \pm 1027.11$  ng/mL),  $p=0.745$ ; DSS group ( $4638.64 \pm 934.99$  ng/mL vs.  $4358.37 \pm 1350.35$  ng/mL) with  $p=0.641$ . Level of adiponectin in DHF overweight group vs. normal weight was  $7.44 \pm 5.03$  ng/mL vs.  $16.82 \pm 10.98$  ng/mL,  $p=0.015$ ; DF group ( $15.93 \pm 10.72$  ng/mL vs.  $16.99 \pm 8.33$  ng/mL),  $p=0.876$  and in DSS group was  $5.99 \pm 2.86$  ng/mL vs.  $8.49 \pm 2.73$  ng/mL with  $p=0.115$ .

**Conclusion:** The means level of sICAM-1 and sVCAM-1, but not sE-Selectin, in DHF, DF, DSS and non-DSS group with overweight was found to be consistently higher than normal weight but it was not statistically significant.

**Keywords:** Dengue hemorrhagic fever, sE-selectin, sICAM-1, sVCAM-1, Overweight children

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