

**Abstract Type : Poster**

**Abstract Submission No. : PO-1117**

## **Plasma Levels of Vitamin D Based on Blood Pressure in Obese Adolescent Boys**

**Alim Musarofah**<sup>1</sup>, Dian Caturini S, B.Sc., M.Sc<sup>2</sup>

<sup>1</sup>Department of Nutrition, Sultan Agung Islamic Teaching Hospital, Indonesia

<sup>2</sup>Department of Program Studi Gizi Kesehatan - FK KMK, Gadjah Mada University, Indonesia

**Objectives:** Between 2007 and 2013, the prevalence of adolescent obesity in Indonesia increased 5.9%, from 1.4% to 7.3%. Obesity in adolescence is a major concern, not only because it may develop into adulthood obesity, but it also contributes to risk of cardiovascular disease, particularly high blood pressure. The risk is higher in boys than girls. Latest trend of previous studies has presented that low vitamin D levels are associated with high blood pressure or hypertension. On the other hand, several studies have reported that low vitamin D levels are common in individuals with obesity. The objective of this study is to examine plasma levels of vitamin D based on blood pressure in obese adolescent boys.

**Methods:** This study is an observational analytic study with cross-sectional design. Subjects were 57 adolescent boys aged 15–18 years with obesity. Obesity was determined by anthropometric BMI-for-age z-scores. Blood pressure was measured by sphygmomanometer in seated rest condition. Vitamin D levels were determined by plasma 25(OH)D levels using ELISA EIA 5396. Data were analyzed by Mann-Whitney U test to determine the differences of vitamin D levels based on blood pressure classification, and Spearman's correlation test to assess the association among those variables.

**Results:** Based on the blood pressure, subjects were 63.2% relatively high and 36.8% classified as normal. All subjects (n=57) were classified as vitamin D deficiency (plasma levels of 25(OH)D <20ng/ml). There were no differences of vitamin D levels between high and normal blood pressure groups (p=0.118). No significant association was found between vitamin D levels with systolic (r=-0.150, p=0.267) and diastolic blood pressure (r=-0.157, p=0.244).

**Conclusions:** There were no differences in plasma levels of vitamin D based on normal and high blood pressure groups. Although it showed a negative relationship, there was no significant association between vitamin D levels and both systolic and diastolic blood pressure.

Table 1. Characteristics of the Subjects Based on Classification of Blood Pressure

Characteristics of the Subjects Based on Classification of Blood Pressure			
Characteristics	Blood Pressure		p-value
	Normotension (n=21)	Prehypertension and hypertension (n=36)	
Age (years)	17.09 ± 0.62	16.86 ± 0.59	0.169
Weight (kg)	94.28 ± 13.51	96.83 ± 13.45	0.496
Height (cm)	168.69 ± 7.81	169.28 ± 6.54	0.771
BMI (kg/m <sup>2</sup> )	33.02 ± 3.09	33.65 ± 3.17	0.466
BMI-for-age (z-scores)	2.69 ± 0.49	2.80 ± 0.45	0.386
<b>Blood Pressure (mmHg)</b>			
Systolic	112.5 (110 – 120)	130 (125.25 – 133.73)	<b>0.001</b>
Diastolic	70 (70 – 80)	90 (80 – 90)	<b>0.001</b>
<b>Blood Pressure Percentiles</b>			
Systolic BP Percentile	43.5 (16 – 63)	89 (79 – 96.5)	<b>0.001</b>
Diastolic BP Percentile	65 (57.75 – 85.75)	97 (90 – 98)	0.001
Vitamin D (ng/mL)	14.92 (14.76 – 15.51)	14.83 (13.68 – 15.04)	0.118

Data were presented in mean ± standard deviation and median (interquartile range)  
 The means were analyzed by Independent sample t-test  
 The medians were analyzed by Mann-Whitney U test

Table 2. Correlation between Plasma Levels of Vitamin D and Blood Pressure in Obese Adolescent Boys

Correlation between Plasma Levels of Vitamin D and Blood Pressure in Obese Adolescent Boys		
Blood Pressure Categories	r-coefficient	p-value
Systolic	-0.150	0.267
Diastolic	-0.157	0.244

Spearman's correlation test was done to evaluate r-coefficient