

MP1-5

The impact of vitamin D status on arterial functions and carotid intima-media thickness in healthy children.

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Introduction: Vitamin D deficiency is accepted as an independent risk factor for atherosclerosis. Several studies addressing the possible role of vitamin D deficiency in the pathogenesis of endothelial dysfunction and vascular stiffness. Arterial stiffening is an important cardiovascular risk factor and an independent predictor of all-cause and cardiovascular death. Increased aortic stiffness index (AoSI) or elastic modulus (AoEM) and/or decreased aortic distensibility (AoD) may suggest the widespread nature of the atherosclerotic process. Vitamin D deficiency is associated with increased carotid intima-media thickness (CIMT) and reported as an independent risk factor for atherosclerosis. In this study, we aimed to study the effects of vitamin D levels on CIMT, elastic properties of aortic artery and carotid artery in healthy subjects. **Methods:** We enrolled fifty-four healthy children who were 3 to 24 months old. We chose subjects for whom vitamin D testing and complete transthoracic echocardiography with carotid artery imaging for the current analysis. We divided our study population into three groups according to the levels of vitamin D: subjects with > 30 ng/ml 25 (OH) D were grouped as sufficient, subjects with 20-30 ng/ml 25(OH) D were grouped as insufficient, and subjects with < 20 ng/ml 25 (OH) D were grouped as deficient. **Results:** Vitamin D deficiency was observed in 16 patients, and vitamin insufficiency was observed in 16 cases. The vitamin D level was within normal limits in 22 cases. No statistically significant difference was found in the three groups regarding to CIMT, the elastic properties of the aortic and carotid arteries (Table 1 and Table 2). **Conclusion:** In the present study, we have shown that CIMT and the elastic properties of the aorta and carotid artery did not change at early stages of vitamin D deficiency. To our knowledge, this is the first such study investigating the impact of vitamin D on carotid artery and aortic vascular functions in healthy children.

Table 1. CIMT and elastic properties of the carotid artery in three groups

Variables	Vitamin D level (ng/ml)			p Value
	≤ 20	21-29	>30	
CIMT	0.44 \pm 0.06	0.43 \pm 0.06	0.44 \pm 0.08	NS
Systolic carotid diameter (mm)	4.92 \pm 0.57	4.87 \pm 0.53	5.07 \pm 0.60	NS
Diastolic carotid diameter (mm)	4.32 \pm 0.52	4.25 \pm 0.48	4.38 \pm 0.55	NS
Carotid strain (%)	14.1 \pm 6.3	15 \pm 6.7	16 \pm 7.3	NS
Carotid distensibility ($\text{cm}^2 \text{ dyne}^{-1} \times 10^{-6}$)	8.2 \pm 3.97	9 \pm 5.5	9.2 \pm 5	NS
Carotid stiffness index	4.3 \pm 2.35	4 \pm 2	3.9 \pm 1.8	NS
Carotid elastic modulus ($\text{cm}^2 \text{ dyne}^{-1} \times 10^{-6}$)	3.08 \pm 1.6	2.88 \pm 1.5	2.7 \pm 1.2	NS

Data are shown as mean \pm standard deviation. NS: Not significant.

Table 2. Elastic properties of the aortic artery in three groups

Variables	Vitamin D level (ng/ml)			p Value
	≤ 20	21-29	>30	
Systolic aortic diameter (mm)	13.2 \pm 1.97	12.8 \pm 2	12.8 \pm 1.6	NS
Diastolic aortic diameter (mm)	12 \pm 0.2	11.7 \pm 1.9	11.6 \pm 1.7	NS
Aortic strain (%)	10.4 \pm 4.5	10.3 \pm 4.6	11 \pm 6.2	NS
Aortic distensibility ($\text{cm}^2 \text{ dyne}^{-1} \times 10^{-6}$)	6 \pm 2.5	6 \pm 2.7	6.5 \pm 4.4	NS
Aortic stiffness index	5.31 \pm 1.64	5.27 \pm 1.57	5.5 \pm 1.73	NS
Aortic elastic modulus ($\text{cm}^2 \text{ dyne}^{-1} \times 10^{-6}$)	3.82 \pm 1.33	3.81 \pm 1.3	3.85 \pm 1.4	NS

Data are shown as mean \pm standard deviation. NS: Not significant.