

Childhood Obesity, MMP-9 Levels, and Vitamin D

Zeynep Cerit

Near East University Hospital, Nicosia – Chipre

Dear Editor,

I have read the article entitled “MMP-9 Levels and IMT of Carotid Arteries are Elevated in Obese Children and Adolescents Compared to Non-Obese” by Andrade et al.¹, recently published in journal, with great interest. The investigators reported that obese children and adolescents present higher mean intima-media thickness (IMT), plasma matrix metalloproteinase (MMP)-9 and MMP-9/tissue inhibitor of metalloproteinase-1 ratio compared to the non-obese. Thus, these findings indicate that this group presents a risk profile for early atherosclerosis.¹

Keywords

Pediatric Obesity; Child; Adolescents; Cardiovascular Diseases; Overweight; Matrix Metalloproteinase 9.

Mailing Address: Zeynep Cerit •

Near East University, Department of Pediatric Cardiology, 07100, Nicosia
E-mail: drceritzeyno@gmail.com, drcerit@yahoo.com
Manuscript received 20/04/2017, revisado em 09/06/2017, aceito em 09/06/2017

DOI: 10.5935/abc.20170127

Childhood obesity is an international public health problem leading to an increased risk of adult obesity and associated with cardiovascular diseases such as hypertension, peripheral and coronary artery disease.² Vitamin D (vit D) may regulate adipose tissue mass, differentiation, and metabolism. Vit D deficiency might contribute with overweight and/or obesity, possibly by effects on lipogenesis and/or adipogenesis.³ Coussens et al.⁴ reported an inverse correlation between circulating vit D concentration and serum inflammatory biomarkers. Increased tumor necrosis factor-alpha (TNF- α) is associated with low vit D concentrations. Vit D down-regulates MMP-9 production by TNF- α and decreases production of MMP-9. Wang et al.⁵ reported that vit D derivatives could significantly inhibit TNF- α induced MMP-2 and MMP-9 secretion in nasal polyp-derived fibroblasts.

In this context, considering a close association among childhood obesity, serum MMP-9 and vit D levels, the correlation of this study's result¹ with serum vit D levels might be beneficial.

References

1. Andrade C, Bosco A, Sandrim V, Silva F. MMP-9 Levels and IMT of Carotid Arteries are Elevated in Obese Children and Adolescents Compared to Non-Obese. *Arq Bras Cardiol.* 2017;108(3):198-203. doi: 10.5935/abc.20170025.
2. Saggese G, Vierucci F, Boot AM, Czech-Kowalska J, Weber C, Camargo CA Jr, et al. Vitamin D in childhood and adolescence: an expert position statement. *Eur J Pediatr.* 2015;174:565-76. doi: 10.1007/s00431-015-2524-6.
3. Cerit Z. Prediction of childhood obesity with or without vitamin D deficiency. *Eur J Pediatr.* 2017;176(4):557. doi: 10.1007/s00431-017-2860-9.
4. Coussens A, Timms PM, Boucher BJ, Venton TR, Ashcroft AT, Skolimowska KH, et al. A1alpha, 25-dihydroxyvitamin D3 inhibits matrix metalloproteinases induced by Mycobacterium tuberculosis infection. *Immunology.* 2009;127:539-48. doi: 10.1111/j.1365-2567.2008.03024..
5. Wang LF, Tai CF, Chien CY, Chiang FY, Chen JY. Vitamin D decreases the secretion of matrix metalloproteinase-2 and matrix metalloproteinase-9 in fibroblasts derived from Taiwanese patients with chronic rhinosinusitis with nasal polyposis. *Kaohsiung J Med Sci.* 2015;31(5):235-40. doi: 10.1016/j.kjms.2015.02.001.

Letter to the Editor

Reply

We would like to thank you and agree with the considerations inserted in the letter about obesity and atherosclerosis. Indeed, we found a close association between obese children and adolescents with atherosclerosis, compared to non-obese ones.¹

Besides, many authors have cited the important role of Vitamin D in these situations. Certainly, there is an inverse association between Vitamin and obesity. In this point, the Vitamin should regulate the adipose tissue metabolism, although its real role is still unknown, that is, whether it is cause or consequence.²

Indeed, obesity and Vitamin D deficiency represent an important health concern in the United States among children and adults.²

Because of the association between cardiovascular risk in obese children and adolescents, Atabeck et al.³ suggest the

prescription of Vitamin D as a way to prevent the premature onset of atherosclerosis. Gul et al.⁴ reported that Vitamin D deficiency could contribute with morbidities associated to childhood obesity, such as increasing cardiovascular cardiometabolic risks, atherogenic dyslipidemia and hypertension.

In short, we think it would be important to promote more studies in order to prevent and treat atherosclerosis in obesity, as well to considerer the other diseases.

Sincerely,

Claudio Andrade
Adriana Bosco
Valeria Sandrim
Francisco Silva

References

1. Andrade C, Bosco A, Sandrim V, Silva F. MMP-9 levels and IMT of Carotid Arteries are elevated in Obese Children and Adolescents Compared to Non-Obese. *Arq Bras Cardiol.* 2017;108(3):108-203. Doi:10.5935/abc.20170025
2. Peterson CA, Belenchia AM. Vitamin D deficiency and childhood obesity: a tale of two epidemics. *Mo Med.* 2014;111(1):49-53. PMID:24645299
3. Atabeck ME, Eklioglu BS, Akyürek N, Alp H. Association between vitamin D level and cardiovascular risk in obese children and adolescents. *J Pediatr Endocr Met.* 2014;27(7-8):661-6. doi: 10.1515/jpem-2013-0379.
4. Gul A, Ozer S, Yılmaz R, Sonmezgoz E, Kasap T, Takçı S, et al. Association between vitamin D levels and cardiovascular risk factors in obese children and adolescents. *Nutr Hosp.* 2017;34(2):323-9. doi: 10.20960/nh.412.