

## Multiple Strategies in Prevention of Metabolic Syndrome Result from Vitamin D Deficiency in Children

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**Abstract :** Background: Nowadays the prevalence of metabolic syndrome (Mets) has taken on a growing trend. Studies have shown the relationship between vitamin D deficiency (VDD) status and Mets in children. Also studies have recorded that exerting strategies for vitamin D status improvement can help prevent Mets in children. This study investigated multiple strategies of prevention of Mets resulting from VDD in children. Methods: This review study has been done by using keywords related to the topic and 54 articles were found (2000-2015) that 25 were selected according to the indicators of Mets, supplementation and fortification of foods with vitamin D and attention to children environment and life style. Results: Studies have suggested the correlation between serum levels of vitamin D with waist circumference ( $p < 0.0001$ ), systolic blood pressure ( $p=0.01$ ), HOMA-IR ( $p=0.001$ ) and HDL cholesterol ( $p < 0.0001$ ). An inverse correlation between serum 25 (OH) D and HOMA-IR ( $p = 0.006$ ) and insulin ( $P = 0.002$ ) has been proved in overweight group. Higher HOMASDS and triglycerides found in vitamin D deficient obese children compared to control group without VDD ( $p=0.04$ ). After supplementation with vitamin D, serum TG concentration decreases significantly ( $p=0.04$ ), and improves insulin resistance ( $p=0.02$ ). The prevalence of VDD is associated with time of watching TV ( $P < 0.01$ ), hours of physical activity per week ( $P = 0.01$ ), skipping breakfast ( $P < 0.001$ ) soda intake ( $P < 0.001$ ), and milk intake per day ( $P < 0.01$ ). Conclusion: According to the beneficial role of vitamin D in prevention of Mets and proven relationship between serum levels of vitamin D and Mets indicators, we can prevent childhood Mets through the application of appropriate strategies such as supplementation and food fortification with vitamin D and positive changes in children life style with especial attention to physical activity in exposure of sunlight and their environment condition.

**Keywords :** children, metabolic syndrome, prevention strategies, vitamin D

**Conference Title :** ICN 2015 : International Conference on Nutrition

**Conference Location :** Cape Town, South Africa

**Conference Dates :** November 05-06, 2015