

25-hydroxyvitamin D Status and Its Impact on Skin Dendritic Cells in Patients with Metabolic Syndrome

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Introduction. Skin is constantly challenged by various exogenous factors such as viral and microbial pathogens. The primary cutaneous innate immunity is known as antimicrobial peptides, from which cathelicidin is among the first discovered. Vitamin D3 is the major factor involved in the regulation of cathelicidin expression. The effect of vitamin D on pathogenesis of metabolic syndrome (MS) is still unknown. Vitamin D has immunomodulatory properties, and it influences the immune system through a number of mechanisms including the action on dendritic cells (DCs) [Sigmundsdottir, 2011].

The aim, materials and methods. The aim of the study is to determine the association of 25-hydroxyvitamin D level in serum and dendritic cells in patients with metabolic syndrome. In this study, a group of both gender patients with metabolic syndrome aged 40–55 years has been analyzed. Patients' clinical examination, measurement of blood pressure and waist circumference were conducted. Blood biochemical analyses (cholesterol, HDL, LDL, vitamin D level) were determined. Full-thickness circular 4 mm *Punch* biopsies were taken in 15 individuals. Specimens were stained with haematoxylin eosin and were investigated by immunohistochemistry. CD1a positive Langerhans cells were evaluated in 3 fields of vision with the calculation of average number of them under magnification of 400 times. Measurements were done by using an ocular ruler.

Results. Mean age in both genders is 52.1 years. Mean waist circumference is 95 cm. Biochemistry results indicated: total cholesterol in blood – mean 6.4 mmol/l, LDL – 3.8 mmol/l, average 25-hydroxyvitamin D – 27.0 ng/ml. The amount of DCs in epidermis varied from 32.6 to 13.5. In cases with low vitamin D level, the number of CD1a+ cells was 16.2. Significant accumulation of DCs around the cluster of inflammatory cells, acanthosis and hyperkeratosis were observed. Different filling of *Birbeck* granules in patients with MS was evaluated, as well as, in some cases, migration of CD 1a+ cells into papillary dermis. Enlargement of adipocytes up to 0.13 mm and fibrosis of deep vessels were revealed.

Conclusion. Our study revealed that 25-hydroxyvitamin D deficiency in MS patients is associated with a smaller amount of dendritic cells in epidermis. In skin conditioned with MS, expansion of adipocytes and dermal fibrosis may point to hypoxia in tissue, which could be directly associated with the presence of metabolic syndrome.