

Skin Immune System and Its Microcirculation Peculiarities in Case of Metabolic Syndrome

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Introduction. Metabolic syndrome (MS) is a clustering of risk factors comprising of abdominal obesity, dyslipidemia, elevated blood pressure, and abnormal glucose tolerance. Chronic inflammation with elevation in the level of proinflammatory cytokines is the hallmark of MS. Oxidative stress, a condition of imbalance between reactive oxygen species and antioxidants, is believed to play a central role in the pathogenesis of MS [Akase, 2013]. Antigen-presenting Langerhans cells (LC) belong to the skin immune system, the function of which could be impacted by presence of MS [Janovska, et al., 2013]. Angiogenesis is a critical component of both neoplastic and chronic inflammatory disorders, but whether angiogenesis also occurs in chronic, latent inflammation due to MS, hence is not evaluated in human skin.

Aim. The aim of the study is to evaluate skin immune system and its microcirculation peculiarities in skin conditioned with metabolic syndrome.

Material and methods. In this study 80 both gender 40–55-year-old patients were studied. Clinical examination entailed: measurement of blood pressure, waist circumference, body mass index, as well as blood biochemical analyses were done. Full-thickness 4 mm *Punch* biopsies were taken from the dorsal surface of the palm.

Hematoxylin eosin staining and immunohistochemistry were done. Number of CD1a, CD31, CD34, CD3, CD8 and microvessel density (MVD) were analyzed in 5 fields of vision at 400 × magnification (EnVision method).

Results. Mean age in both genders is 52 years. Mean waist circumference is 95 cm. Total cholesterol in blood – mean 6.4 mmol/l, LDL – 3.8 mmol/l. Presence of MS significantly correlated with CRP ($p = 0.02$). The amount of Langerhans cells (LCs) in epidermis varied from 32.6–13.5. The accumulation of LCs was mainly in epidermis, but some interactions between lymphocytes and CD1 positive cells were revealed. Different filling of Birbeck granules and LCs migration into papillary dermis have been found. The amount of microvessels in 1 field of vision varied from 8.5–15.4 (mean – 11.2). Opposite in subjects from non-MS skin, the average amount was 7.4 in 1 field of vision ($p < 0.05$). Diameter of vessels varied from 0.01 to 0.1 mm in deeper layers up to 0.25 mm. Small groups of CD3+ lymphocytes pericapillary were presented.

Conclusion. In subjects with MS LCs activity has been changed, as well as, filling of Birbeck's granules. Increased microvessel density in skin realizes intensified blood supply of affected skin by MS.