Summary

Retinal microvascular abnormalities in depression

Depressive disorder is a debilitating and most common mental disorder. According to the World Health Organization, approximately 280 million people worldwide suffered from depression in 2019. Studies seeking to identify biomarkers for depressive disorder diagnosis and treatment have not yet found any one candidate which achieves a sufficient sensitivity and specificity. The aim of the study was to find a possible association between retinal microvascular abnormality and major depression in a non-geriatric study population. The participants with major depression were hospitalised at the University Hospital in Hradec Kralove, Department of Psychiatry. Retinal images were obtained using a stationary Fundus camera FF450 by Zeiss and a hand-held camera by oDocs. Fifty patients (men N = 18, women N = 32) aged 16 to 55 (men's average age 33.7±9.9 years, women's average age 37.9±11.5 years) were compared with fifty mentally healthy subjects (men N = 28, women N = 22) aged 18 to 61 (men's average age 35.3±9.2 years, women's average age 36.6±10.6 years) in a cross-sectional design. The patients were diagnosed with a single depressive episode (N = 26) or a recurrent depressive disorder (N = 24) according to the ICD-10 classification. Our results confirmed significant microvascular changes in the retina in the patients with depressive disorder in comparison to the control group of mentally healthy subjects, with significantly larger arteriolar ($P < 0.0001$) as well as venular ($P < 0.001$-0.0001) calibres in major depression. According to the literature, acute and chronic neuroinflammation is associated with changes in the microvascular form and function. The endothelium becomes a major participant in the inflammatory response damaging the surrounding tissue and its function. Because the retina and brain tissue share a common embryonic origin and are situated near each other, we suspect similar microvascular pathology in the retina and in the brain in major depression. Our results may contribute to a better understanding of depression etiopathogenesis and to its personalized treatment.