Streszczenie w języku angielskim

Endothelin-1 (ET-1) is widely distributed in human tissues and is secreted mainly by vascular smooth muscle cells (VSMC). It is responsible for strong vasoconstriction and contributes to the development of inflammatory processes.

Myopia is one of the most common eye disorders in the world. Pathological or high myopia is usually defined as the spherical equivalent (SE) ≥−6.00 diopters (D) or the axial length of the eye > 26 mm. There are numerous literature reports on the involvement of environmental and genetic factors in the development and progression of myopia, but there is limited data regarding cellular mechanisms.

Uveitis is the inflammation of the uveal tract which lines the inside of the eye behind the cornea. Many scientific reports provide data on the significance of higher ET-1 concentration in uveitis associated with rheumatological diseases or in induced uveitis on animal models, but ET-1 level in chronic idiopathic uveitis has not been established to date.

The study aimed to evaluate the concentration of ET-1 in the blood of children and adolescents with high myopia and its association with the axial length of the eye and the presence of myopic retinal degeneration. The purpose of the second study was to determine ET-1 concentration in the blood of children and adolescents with chronic idiopathic uveitis and its relationship to the anatomical location and grade of inflammation.

The cross-sectional studies were carried out in 57 patients with high myopia and 29 control subjects and 17 patients with chronic idiopathic uveitis and 22 healthy controls. In both studies, control groups were matched by age and sex. Serum concentrations of ET-1 were measured using an enzyme-linked immunosorbent assay (ELISA) kit.

A significantly lower concentration of ET-1 in highly myopic patients compared to controls was found (median (Q1; Q3): 1.47 (0.91; 1.87) *vs* 1.94 (1.1; 2.69) pg/mL, $p = 0.005$). No correlation was established between ET-1 concentration and age, either in highly myopic patients or controls ($r = 0.124$, $p = 0.364$ or $r = 0.069$, $p = 0.772$, respectively).In patients with high myopia, a weak negative correlation between ET-1 concentration and the longest axial length out of the two eyes was found ($r = -0.255$, $p = 0.0558$).

In further analysis, no significant differences were found between ET-1 concentrations in different patient subgroups when gender ($p = 0.841$), age ($p = 0.942$) and presence of peripheral chorioretinal atrophy ($p = 0.649$) were taken into consideration. All patients with peripheral chorioretinal atrophy had the axial length of the eye > 26 mm. Significantly lower

ET-1 concentration was found in patients with the axial length of the eye > 26 mm in comparison to those with the axial length ≤ 26 mm [median (Q1; Q3): 1.23 (0.78; 1.72) *vs* 1.61 (1.12; 2.04) pg/mL, $p < 0.041$] and controls [median (Q1; Q3): 1.23 (0.78; 1.72) *vs* 1.94 (1.1; 2.69) pg/mL, $p < 0.001$]. There was no difference between ET-1 concentration in patients with the axial length of the eye ≤ 26 mm and controls.

Statistically significant lower ET-1 concentration in patients with chronic idiopathic uveitis in comparison to controls was found [median (Q1; Q3): 1.33 (1.22; 1.48) *vs* 1.93 (1.1; 3.11), $p = 0.008$]. No correlations were found between ET-1 concentration and age, either in chronic idiopathic uveitis patients or controls.

Nine out of 17 patients presented with anterior uveitis, 5 with posterior and 3 with panuveitis. There were no differences in ET-1 concentrations between anterior, posterior and panuveitis [median (Q1; Q3): 1.37 (1.28; 1.48) *vs* 1.22 (0.95; 1.39) *vs* 1.33 (1.22; 1.50) pg/mL; $p = 0.634$, respectively].

No significant differences in ET-1 concentration between varying grades of ocular inflammation in uveitis were observed: between grade 0.5+ *vs* 1+, where the number of inflammatory cells in anterior chamber of the eye was assessed [median (Q1; Q3): 1.44 (1.1; 1.52) *vs* 1.33 (1.28; 1.37) pg/mL; $p = 0.745$], between grade 1+ *vs* 2+, where anterior chamber flare was evaluated [median (Q1; Q3): 1.44 (1.22; 1.50) *vs* 1.33 (1.28; 1.37) pg/mL; $p = 0.711$] and between grade 1 *vs* 2, where vitreous haze was assessed [median (Q1; Q3): 1.27 (1.22; 1.50) *vs* 1.17 (0.95; 1.39) pg/mL; $p = 0.868$].

The effects of ET-1 may be impaired in children and adolescents with high myopia and chronic idiopathic uveitis.

Lower ET-1 concentration in patients with the axial length of the eye > 26 mm or with the presence of peripheral chorioretinal atrophy, may co-occur with high myopia and should be considered as a risk factor in the pathophysiology of high myopia progression.

ET-1 concentration in patients with chronic idiopathic uveitis was decreased irrespective of the anatomical location and grade of ocular inflammation. We conclude that lower ET-1 levels play a crucial role in disturbed vascular tone control and can result in permanent visual impairment in chronic idiopathic uveitis.