SUMMARY

Peyronie's disease is a rare condition. The etiology and pathogenesis of PD is still unexplained. The estimated incidence is 0.4-9%. The disease usually develops between 55 - 60 years of age. As a result of Peyronie's disease, a fibrous/calcified plaque is formed in the tunica albuginea, usually on the dorsal part of the penis. This plaque causes penile curvature, that prevents or hinders sexual intercourse.

Penile microtrauma resulting from sexual activity are considered to be the most common cause of disease development. Two stages of the disease were distinguished. The first of these is an acute inflammatory phase, which is manifested by penile pain in a state of flaccidity, painful erections, a palpable nodule or fibrous plaque in the penis and the development of penile curvature. The second phase (chronic phase) is a fibrosis, during which the plaque becomes solid and the curvature of the penis is stabilized.

For conservative treatment of Peyronie's disease, oral, topical and injectable medicines are used. Some efficacy can be achieved by administering verapamil (VER) or dexamethasone (DEX) in the form of an injection into the plaque. At the moment there are no definite patterns of conservative treatment due to the limited number of patients being treated and a small number of studies in different patient populations: the inflammatory phase and the chronic phase. Surgical treatment involving the correction of penile curvature includes only patients in stable chronic phase of the disease for at least 3 months.

The aim of the study was to assess the activity of prolidase and proline oxidase expression in the plasma of patients with Peyronie's disease treated conservatively with verapamil (VER) and dexamethasone (DEX) in the form of an injection into the tunica albuginea of the penis in correlation with the evaluation of clinical improvement of the disease and an attempt to develop the in-vitro model of Peyronie's disease.

The study group consisted of 20 men with PD aged from 43 to 68 years (mean 57.3 years). All patients have been in a chronic (stable) phase of the disease for at least 12 months. Verapamil (VER) was administered as a local injection into the penile plaque at a dose of 5 mg every week for 10 weeks. Then dexamethasone (DEX) was administered also as an injection at a dose of 8 mg every 4 weeks for 6 months.

The material for laboratory tests was peripheral blood, which was collected three times: before treatment, after treatment with verapamil and after completion of dexamethasone treatment.

The control group for laboratory tests consisted of 20 healthy men between the ages of 55 and 60 years.

The in-vitro model of Peyronie's disease was performed using human dermal fibroblast culture under the influence of experimental nterleukin-1 induced inflammation and experimental cell damage (wound healing assay). In the described models, the effect of verapamil (VER) and dexamethasone (DEX) on selected parameters such as cell viability, DNA and collagen biosynthesis and prolidase activity was evaluated.

Patients with Peyronie's disease have shown an increase in prolidase activity, which probably suggests enhancement of repair processes and stimulation of collagen biosynthesis. Although no increase in prolidase expression has been demonstrated, there has been an increase in prolidase phosphorylation at the tyrosyl residue, leading to increased enzymatic activity of prolidase.

In studies of the Peyronie’s disease in vitro model, both verapamil (VER) and dexamethasone (DEX) were inhibitors of collagen biosynthesis.

It was found that in the wound healing (WH) model, collagen biosynthesis and prolidase activity were strongly inhibited by both verapanil (VER) and dexamethasone (DEX), while in the inflammation model (IL-1), prolidase activity was inhibited only by dexamethasone (DEX).

Based on the conducted studies, the conclusion was drawn that the PD inflammatory phase should be treated with verapamil (VER), and the fibrosis phase (stabilization) with both verapamil (VER) and dexamethasone (DEX).