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The effectiveness of Promogran in the treatment of neuropathic foot ulcers in diabetic patients with nephropathy.

Strakhova G. Yu., Tokmakova A. Yu., Arbuzova M. I., Galstyan G.R.
National Research Centre for Endocrinology, Moscow, Russia.

Diabetic nephropathy is believed to delay wound healing. Previous studies indicated that diabetic patients with chronic wounds have increased level of the collagenolytic enzymes. **Therefore the aim** of our study was to assess wound healing, collagenolytic activity (CA) of blood plasma and levels of matrixmetalloproteinase (MMP-2 and MMP-9) in diabetic patients with nephropathy and to evaluate the effectiveness of Promogran in the treatment of neuropathic foot. **Methods:** 48 diabetic patients with neuropathic foot (23M/25F, mean age 51.9±14.4 yrs, diabetes duration 17.0±8.7 yrs, HbA1c 9.2±1.8%). 22 patients with nephropathy were enrolled in gr.1; 26 patients without nephropathy in gr.2; 20 patients with acute wounds in the control group. Patients were matched for sex, age, duration of diabetes, HbA1c ($p>0.05$). Average wound area was 3.87 (2.3;5.9) cm2 in gr.1 and 3.9 (2.6;11.3) cm2 in gr.2. Patients followed for 6 weeks period. The first 3 weeks they were treated with standard care (off-loading, frequent debriding, topical application of gauze dressings) and the last 3 weeks with Promogran. The CA of blood plasma was measured by photometry. The concentrations of MMP-2 and MMP-9 were measured by enzyme-linked immunosorbent assays ("R&D Systems"). **Results:** By the end of standard care the healing velocity was 1.36 (1.17;1.71) mm/week in gr.1 and 1.6 (1.38;2.1) mm/week in gr.2 ($p=0.034$). After treating with Promogran we found a significantly increase of wound healing in patients of both groups: up to 1.79 (1.4;2.1) mm/week in gr.1 ($p<0.05$) and up to 1.99 (1.75;2.33) mm/week in gr.2 ($p<0.001$). At baseline the CA of blood plasma and level of MMP-2 were authentically higher and level of MMP-9 was lower in diabetic patients with foot ulcers than in patients with acute wounds ($p=0.0001$) and didn't decrease during 3 weeks of healing. The initial concentration of MMP-9 was significantly higher in gr.1 ($p=0.023$). After treating with Promogran the CA of blood plasma and level of MMP-2 significantly increased in the both groups ($p<0.05$) and the level of MMP-9 significantly decreased in gr.2 ($p<0.05$). The same dynamics of activity of collagenolytic enzymes was found in control patients. **Conclusions:** Thus, we suggest that the defects of wound healing in diabetic patients, especially in patients with nephropathy, can be explained by a dysfunction activity of collagenolytic enzymes. Promogran promotes wound healing in chronic wounds and may be a useful adjunct in the management of neuropathic foot.