Summary

Burn is a damage to tissues resulting from thermal, chemical, radiation, electric current or electrical discharges. J. Strużyna describes a burn as inflammatory or necrotic changes in coatings and tissues resulting from the action of various types of energy, when the body crosses possible protective barriers (6). A burn is a systemic disease that affects not only the burned area, but also involves the violation of the most important physiological processes necessary for the survival of the human body. These disorders are greatest in severe burns.

Burn disease is a consequence of burns and develops as a result of rapid fluid loss and the release of a huge amount of inflammatory mediators causing a generalized inflammatory response to the injury. The extreme consequence of burn disease is hypovolemic shock, or (multisystem failure syndrome - MODS).

The extent and depth of the burn depends on many factors, but the most important is the temperature of the brewing agent and its duration on the tissue. Therefore, in the initial procedure it is important to cool the burn site. Correlation of the depth of injury and its surface allows classification of burns according to their severity.

The primary goal of burn treatment is to save the patient's life and health. At the same time, it is extremely important to restore the patient's appearance before the burn period and to restore full physical, mental and social fitness. That is why highly specialized care is needed in burn treatment centers.

Laser therapy in the treatment of both atrophic and hypertrophic scars is increasingly used. The effect of treatment is conditioned by many factors, such as the type of scar, its size, depth, part of the body on which it was formed, and the period that separates its occurrence from the start of treatment. The results of this treatment are very promising and give hope to many patients to improve the quality of life.

The aim of the study was to determine the concentration of matrix-2 metalloproteinase and its correlation with the concentrations of basic building components of the basal membrane-laminin-5 and type IV collagen in the plasma of burned patients. We found that laminin-5 and type IV collagen levels were elevated early after the burn in the plasma of the studied patients and were the highest 12-16 hours after the injury. MMP-2, laminin-5 and type IV collagen levels were not proportional to the degree of burn.

In another study, we determined the plasma concentration of the immunoproteasome in children with moderate to severe burns and its correlation with the circulating proteasome and the

carboxyl terminus of ubiquitin L1 hydrolase (UCHL1) with a plasmon resonance imaging biosensor. The concentration of immunoproteasome, 20S proteasome and UCHL1 in the blood plasma of their patients were the highest 12 hours after the burn, slowly decreased with time, and on the 5th day were even higher than in the control group ($p < .05$). There was a strong correlation between immunoproteasome and 20S proteasome concentrations 6 hours and 5 days after the burn, and a moderate correlation 12 hours after the burn ($P < 0.05$). Immunoproteasome concentration was elevated after injury and slowly reached the normal range during wound healing. We have shown a strong correlation between the immunoproteasome and 20S proteasome concentrations in the serum of children with moderate and severe burns.

In a review paper I presented the principles of treatment of hypertrophic burn scars using an LPDL and CO2 laser. Laser therapy in children has great potential to improve the appearance of these scars. Recent research has demonstrated the success of using dye laser pulse therapy to reduce burn redness and itching, and the use of fractional CO2 laser ablation therapy to improve scar texture and thickness. If future research confirms the effectiveness of laser therapy it can ultimately change standard scar treatment practices.