

## **ABSTRACT**

The state of critically ill patients suffering from polytrauma or sepsis is characterised by pathophysiologic processes, which cause significant changes in an organism on both a local and a systematic level.

A stressful situation elicits an acute inflammatory response. This response is primarily meant to be a defence mechanism; however, this mechanism might become harmful to a certain degree. Hormones, cytokines and growth factors are included among the main control mechanisms activated during inflammatory response. A metabolic response to a stressful situation is characterized by an increased turnover of proteins, lipids, and glucose. Clinical consequences may develop as a result of these metabolic responses and include inflammation, anorexia, immobility, increased vascular permeability (which results in edema), vasodilation, tachycardia, and increased cardiac output. There are some key factors which have a negative contribution on an inflammatory response. Those factors may include malnutrition, pre-existing inflammatory activity, severe infection, obesity, ageing, genotype, and finally gender-gene effects, which may also play a role.

The development of significant hormonal changes can be typified for critically ill patients. Such changes are particularly connected to catecholamines, thyroid hormones, cortisol, growth hormone, and prolactin. Insulin also plays a very important role. The presence of stress hyperglycaemia is also typical.

The metabolic and clinical response in critically ill patients could be significantly influenced by an appropriate choice of hormonal and nutritional support, leading to real benefits for the patient. The nutrients which may be important components of immunonutrition include glutamine, arginine, N-acetyl cysteine, branched-chain amino acids, nucleotides, long-chain n-3 fatty acids, antioxidant vitamins, trace elements, and taurine.

**Key words:** polytrauma, hormones, therapy