

## **Abstract**

Cardiac arrest is an extremely serious condition characterized by global ischemia followed by reperfusion after successful resuscitation and restoration of spontaneous circulation. Despite all advances in current medicine, the prognosis of cardiac arrest survivors remains very poor. One of the major problems in these patients is, therefore, the early and reliable determination of the prognosis that is necessary for choosing the most appropriate diagnostic and therapeutic approach. However, the current possibilities for early prognostication in cardiac arrest survivors remain very limited.

The aims of our work were: (i) to study the possibilities of influencing oxidative stress as one of the key pathogenic factors involved in the development of so-called post-cardiac arrest syndrome; and (ii) to determine the prognostic value of copeptin, neuron-specific enolase (NSE) and markers of oxidative stress in cardiac arrest survivors.

In the experimental part of the work we used porcine model of cardiac arrest for the comparison of the effects of hypothermia, ischemic postconditioning (IPC) and administration of nitric oxide (NO) on oxidative stress burden and organ damage; we found that neither NO nor IPC did have a superior protective effect over hypothermia. In the clinical part we have in several trials shown that both copeptin and especially NSE, measured at a specific time points, offer a high prognostic value for the determination of short- and long-term prognosis. On the other hand, the prognostic value of the markers of oxidative stress has been low in our studies and not sensitive and specific enough for clinical use.

In conclusion, our results revealed that copeptin and especially NSE can be used in clinical practice to increase the current possibilities of prognostication after cardiac arrest.