Summary and Conclusions

TECHNOLOGY AND TARGET GROUP: Sudden cardiac arrest is not uncommon as a complication of coronary heart disease (ischemic heart disease). Most cases of cardiac arrest occur out-of-hospital. In Sweden, approximately 10,000 people per year experience cardiac arrest. Treatment outcomes among this patient group have not improved substantially in the past 20 years. Only 4% of those affected are discharged alive from the hospital following cardiopulmonary resuscitation and treatment. The outcome of treatment depends partly on the time that has elapsed between cardiac arrest and the reestablishment of stable circulation. Most patients who are resuscitated from cardiac arrest are unconscious and require care at an intensive care unit. Lowering the body temperature (induced hypothermia) after resuscitation from cardiac arrest is a treatment method intended to limit the damage, mainly to the brain, that occurs when blood circulation ceases. Body temperature is lowered to 32–34 degrees, which usually requires sedation of the patient, administration of muscle relaxants, and the subsequent use of ventilator treatment. In Sweden, an estimated 1300 people per year are admitted to hospital alive following resuscitation from cardiac arrest. The potential target group for therapeutic hypothermia includes people who are unconscious after resuscitation from cardiac arrest and whose condition would suggest a risk for tissue damage due to oxygen deficiency. Most would be patients with coronary heart disease. Criteria have not been established for selecting patients for therapeutic hypothermia, so the size of the potential target group for this treatment method cannot be estimated.

PRIMARY QUESTION: This assessment is based on a systematic literature review. The question is whether treatment that lowers the body temperature by 3 to 5 degrees after resuscitation from cardiac arrest can increase the chance for survival or reduce the risk for permanent functional impairment.

PATIENT BENEFIT: Two randomized controlled clinical trials have assessed the effects of hypothermia after resuscitation from cardiac arrest. Survival and neurological function were used as outcome measures. One of the studies found an association between hypothermia and improvements in survival and neurological function. The second study showed that patients in the therapeutic hypothermia group could be discharged to a lower care level than the patients in the control group. Regarding study quality and relevance, the first study was rated high and the second study was rated low. Regarding complications or side effects, no significant differences were reported between the study and control groups.

ETHICAL ASPECTS: The most important ethical question concerns the fact that the method has not been adequately assessed. Even if the method appears to have a positive effect it must be thoroughly assessed so the benefits from the healthcare resources consumed can be appropriately weighed against the benefits of providing care for other patient groups.

ECONOMIC ASPECTS: The costs for therapeutic hypothermia consist partly of investment and operational costs for hypothermia equipment and partly of staff costs for the extra 1 to 2 days of intensive care associated with treatment. During therapeutic hypothermia, the patient must be placed on a ventilator. The cost effectiveness of treatment cannot be calculated since the effects of treatment are uncertain.

SBU’s appraisal of the evidence

The scientific evidence is insufficient* to show that treatment with induced hypothermia after resuscitation from cardiac arrest improves survival or lowers the risk for permanent functional impairment. Although the scientific evidence is too weak to support reliable conclusions, the method appears to be promising and potentially may be of clinical importance. However, it is essential to continue testing this method in Sweden under scientifically acceptable conditions so that its benefits, risks, and cost effectiveness can be assessed. Until adequate scientific evidence is available, therapeutic hypothermia should be used only within the framework of well-designed, prospective, and controlled trials.

*Criteria for Evidence Grading SBU’s Conclusions, see page 2
References


