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Clinical Paper

Health-related quality of life improves during the first six months after cardiac arrest and hypothermia treatment☆

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ABSTRACT

Aim of the study: To investigate whether there were any changes in and correlations between anxiety, depression and health-related quality of life (HRQoL) over time, between hospital discharge and one and six months after cardiac arrest (CA), in patients treated with therapeutic hypothermia (TH).
Method: During a 4-year period at three hospitals in Sweden, 26 patients were prospectively included after CA treated with TH. All patients completed the questionnaires Hospital Anxiety and Depression Scale (HADS), Euroqol (EQ5D), Euroqol visual analogue scale (EQ-VAS) and Short Form 12 (SF12) at three occasions, at hospital discharge, and at one and 6 months after CA.
Result: There was improvement over time in HRQoL, the EQ5D index ($p = 0.002$) and the SF12 physical component score (PCS) ($p = 0.005$). Changes over time in anxiety and depression were not found. Seventy-three percent of patients had an EQ-VAS score below 70 (scale 0–100) on overall health status at discharge from hospital; at 6 months the corresponding figure was 41%. Physical problems were the most common complaint affecting HRQoL. A correlation was found between depression and HRQoL, and this was strongest at six months ($rs = -0.44$ to -0.71, $p \leq 0.001$).
Conclusion: HRQoL improves over the first 6 months after a CA. Patients reported lower levels of HRQoL on the physical as compared to mental component. The results indicate that the less anxiety and depression patients perceive, the better HRQoL they have and that time can be an important factor in recovery after CA.

1. Introduction

Cardiac arrest (CA) is a life-threatening condition, and the survival rate is low. In Europe, approximately 275,000 CA cases are treated annually by the emergency medical service, and of those 27,000 are expected to survive until hospital discharge.[1] In 2011, the survival rate one month after out-of-hospital CA in Sweden was 10.4%.[2] During CA, the brain is vulnerable to hypoxia, which may cause ischaemic injury and associated long-term dysfunction.[3,4] Studies have found cognitive problems in between 6 and 100% of CA survivors.[5] In 2002, two randomized controlled studies showed improved neurological outcome after CA in patients treated with therapeutic hypothermia (TH),[6,7] which is now recommended as treatment after CA.[8,9] TH is considered neuroprotective because it lowers oxygen consumption, metabolic rate, free radicals, biochemical markers and has anti-inflammatory effects.[10,11] However, patients treated with TH after CA still show cognitive and functional impairment.[10,12–15] Studies comparing CA patients treated with or without TH found no difference in cognitive function or quality of life (QoL).[10,13] Cognitive dysfunctions are related to QoL and affect it negatively.[16] Results from previous studies on QoL after CA are conflicting. Some have reported decreased QoL after CA, though not always statistically significant differences from the general population.[10,14,17] In one study, QoL after CA was lower than for the general population.[18] Others have shown that CA survivors have acceptable or good QoL, though not necessary the same QoL as before the CA.[19] Anxiety and depression have been shown to be strongly related to QoL [16] and are present in CA patients.[12,18]

Little is known about changes over time in anxiety, depression and health-related quality of life (HRQoL) in CA survivors treated with TH. Therefore, the aim of the present study was to investigate whether there were any changes in anxiety, depression and HRQoL between hospital discharge and one and six months after CA in patients treated with TH. Another aim was to study possible relationships between anxiety, depression and HRQoL.

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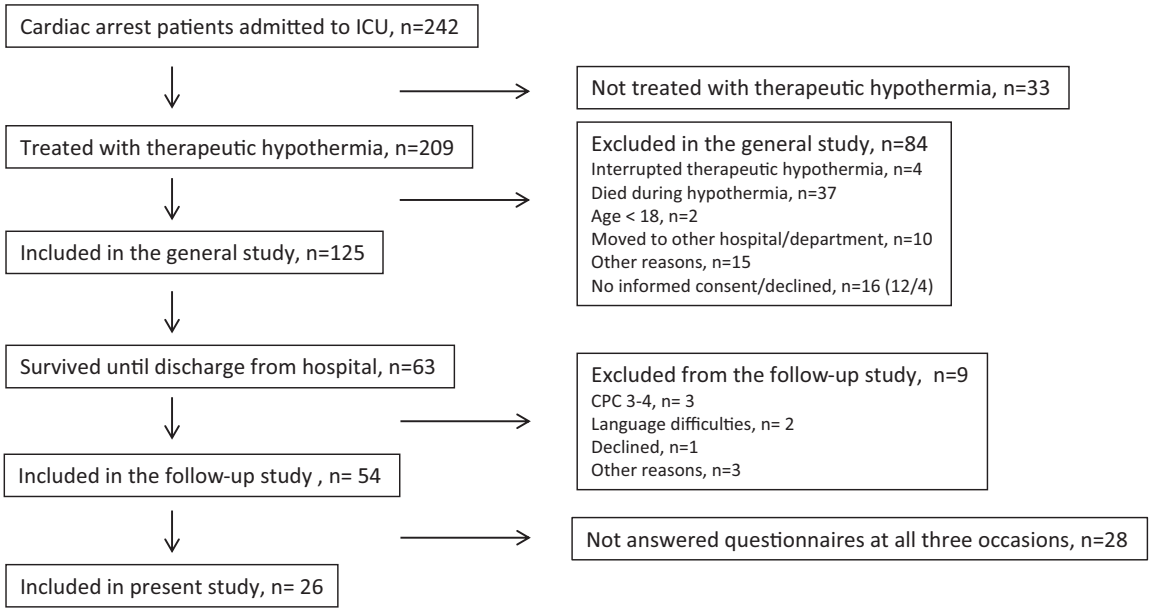

Fig. 1. Flow chart over CA patients admitted to ICU.

2. Materials and methods

2.1. Study area and population

The present investigation was a prospective observational study at one university hospital and two general county hospitals in Sweden. Patients considered for inclusion had suffered a CA, been treated with TH and survived until hospital discharge with a good functional outcome defined as being able to complete the questionnaires. The patient had to be discharged from hospital within one month post-CA and to answer the questionnaires at all three occasions. Participants needed to be 18 years or older and have sufficient knowledge of the Swedish language to complete the questionnaires. During the study period, 242 CA-patients were admitted to the ICUs, 209 underwent TH, and of the 209, 125 were included in the general study. Sixty-three patients survived until hospital discharge and 54 answered the questionnaires at least one of the occasions. Twenty-six patients were able to answer the questionnaires at all three occasions and could thus be included in the study. Fig. 1 is showing the inclusion process.

2.2. Therapeutic hypothermia

The decision to start TH was taken for all patients with a Glasgow Coma Scale (GSC) [20] score <8, irrespective of the first registered ECG rhythm or whether the CA occurred in or out of hospital. The patients were cooled to 32–34 °C for 24 h. Hypothermia treatment was induced by infusion of a 4 °C intravenous saline, in a planned volume of 30–40 ml/kg. To maintain cooling, all hospitals used external cooling, either ice packs or cooling suits depending on hospital-specific routines. Rewarming at a rate of 0.5 °C/h was used and 36 °C was considered the normal core temperature. Before cooling, all patients were sedated, intubated and mechanically ventilated according to local ICU guidelines for severely ill patients adapted for TH after CA.

2.3. Data collection

Patients were included from May, 2008 to May, 2012. Follow-up data were collected at three occasions. The first occasion was at hospital discharge (M1), which occurred within 1 week post-CA for eight participants, within 2 weeks for ten, within 3 weeks for five, and within 3.5 weeks for three participants. The second occasion (M2) was at one month post-CA and the third (M3) after six months. At M1, one study manager met the patient; at M2 the questionnaires were sent by post after telephone contact. At M3 a study manager again met with the patient. Functional outcome was assessed using the Pittsburgh Cerebral Performance Categories (CPC).[21] Standardized questionnaires used were the Hospital Anxiety and Depression Scale (HADS), the Euroqol (EQ5D) and the Short Form 12 (SF12); medical background variables were retrieved from the medical chart. Socio-demographic variables prior to CA were collected by self-report at M1. At M3, the participants answered questions about their working situation and whether they had been in contact with any health service.

2.4. HADS

HADS is a 14-item standardized questionnaire designed to assess mood disorders in non-psychiatric hospital patients. The questionnaire is divided into two subscales measuring signs of anxiety and depression. The highest possible score for each subscale is 21, higher scores representing more emotional problems. A score of 0–7 for each subscale indicates no anxiety or depression, 8–10 mild to moderate anxiety or sadness, and a score of 11 or higher indicates risk for occurrence of anxiety disorders or depression requiring medical treatment.[22]

2.5. EQ5D

The EQ-5D health status standardized questionnaire is a self-reporting questionnaire and comprises 5 questions – each with 3 levels. Level one represents no problems, level two some problems, and level three extreme problems. The 5 questions correspond to 5 health domains: pain, mood, mobility, self-care and daily activities.[23,24] EQ5D can be converted into a single summary index, where the highest possible index for HRQoL in all domains is 1.00.[24] The mean score in a Swedish population was 0.82.[25] The Euroqol visual analogue scale (EQ-VAS) is a measure of self-rated overall health status and ranges from 0 to 100.[23,24] The mean score in a Swedish population was 76.5.[25]