Case report

Deep accidental hypothermia accompanied with cardiac arrest after alcohol and drug poisoning treated with extracorporeal life support

Konstantinos Grapatsa,a,b, Vasileios Leivaditisa,a, Ioannis Panagiotopoulosc, Konstantinos Spiliotopoulosd, Efstratios Koletsis,e, Manfred Dahma,a, Christofo罗斯 Kosmidisf, Stella Laskouf, Paul Zarogoulidisg,∗, Athanasios Katsaounisf, Efstatios Pavlidisd, Dimitrios Giannakidisj, Charilaos Koulourisf, Stylianos Mantaloves, Fotis Konstantinouh, Aikaterini Amaniti, Alexandru Munteanuf, Valeriou Surlingk, Konstantinos Sapalidisf, Isaak Kesisogloui

a Department of Cardiothoracic and Vascular Surgery, Westpfalz Klinikum, Academic Educational Hospital, Mainz University, Kaiserslautern, Germany
b Department of Thoracic Surgery, Medical Center–University of Freiburg, Faculty of Medicine, University of Freiburg, Freiburg, Germany
c Department of Cardiothoracic Surgery, Henry Danani Hospital, Athens, Greece
d Department of Cardiothoracic Services, The Newcastle upon Tyne Hospitals, NHS Foundation Trust, UK
e Department of Cardiothoracic Surgery, University of Patras, Patras, Greece
f 3rd Department of Surgery, "AHEPA" University Hospital, Aristotle University of Thessaloniki, Medical School, Thessaloniki, Greece
g Pulmonary Department, "Thessaloniki" Cancer Hospital, Thessaloniki, Greece
h Thoracic Surgery Department, University General Hospital of Alexandroupolis, Democritus University of Thrace, Alexandroupolis, Greece
i Anesthesiology Department, "AHEPA" University Hospital, Aristotle University of Thessaloniki, Medical School, Thessaloniki, Greece

ARTICLE INFO

Keywords:
Hypothermia
Resuscitation
ECMO
Cardiac arrest

ABSTRACT

Deep accidental hypothermia is an unusual clinical entity in developed countries. We report a case of a 30 year old male Caucasian patient with accidental severe hypothermia who was transferred to the emergency department of our hospital after prolonged exposure in the urban city’s night environment cold as a result of alcohol and drugs abuse. The patient was found unconscious in the first early hours from onlookers. The time that the patient remained unconscious is unknown. During the transfer to the hospital because of cardiac arrest cardiopulmonary resuscitation began. In the emergency department an extracorporeal life support system (ECLS) was implanted under cardiopulmonary resuscitation in order to achieve hemodynamic stabilization and rapid and safe rewarming. The patient’s rewarming lasted 6 hours. The patient was extubated the next day.

1. Background

Deep accidental hypothermia (DAH) is an unusual emergency clinical emergency with a possible high mortality. The exposure to the cold environment could be caused from an intoxication of alcohol or drugs or from other diseases by elder people [1–4]. The use of extracorporeal circulation (ECC) can provide a fast and safe body rewarming with good results [2,4]. In patients with cardiac arrest and DAH the use of ECC can be a life-saving treatment [1]. The application of these techniques should be performed by skilled staff and are therefore mostly performed in specialized cardiothoracic clinics [2]. Here we report a case of a patient who was transferred to the emergency department of the Westpfalz Klinikum in Kaiserslautern, Germany with DAH and cardiac arrest and was successfully treated with rewarming using ECLS.

2. Case presentation

A 30-year-old male patient with unknown former clinical history and identity was found unconscious from passing people early in the morning (06:30 local time). The city’s first aid service was alerted and the patient was transferred to the hospital’s emergency department. The city environment’s temperature during that night was −5 °C.

During his transfer the patient had a blood pressure from 50 mmHg and because of cardiac collapse cardiopulmonary resuscitation (CPR) followed. Due to ventricular fibrillation episodes, he needed to receive three electric defibrillations. CPR was continued in the emergency department, while the patient was intubated. The patient hat dilated eye
pupils and the body's temperature was 25 °C.

The cardiothoracic surgical department was called and a veno-arterial extracorporeal life support (va-ECLS) was placed through percutaneous approach under CPR. The ECLS system was implanted 45 minutes after the start of CPR. At the time of the ECLS installation the patient had a rhythm atrial fibrillation. After the ECLS implantation the patient was transferred to the cardiothoracic intensive care unit in a stable hemodynamic and respiratory condition. At the point of the patient's entry at the intensive care unit the blood gas analysis showed normal values. After 6 hours of rewarming and after the patient's temperature reached 36.8 °C the ECLS was successfully removed. After the patient's rewarming and at the time of the ECLS explantation the patient had a sinus rhythm. Weaning from ventilator followed and the patient was successfully extubated on the next day. After the extubation the patient showed a clinically normal condition. He remained cardiopulmonary stable without any neurological deficits. In the next days the patient showed drug and alcohol withdrawal symptoms (anxiety, anger, aggression, excitability and restlessness). Because of the unknown medical history and his former neurological condition a computer tomography (CT) scan of the brain was decided. No signs of hypoxia or any other pathological findings were demonstrated. The toxicological tests which were additionally carried out confirmed the drug intoxication. Except the drug and alcohol withdrawal symptoms the further clinical course was uneventful. The 7th day after the ECLS explantation the patient was transferred in the department of neurology for further treatment.

3. Discussion

The current advances made in the field of prehospital treatment have improved the patients’ survival. DAH is characterized from drop of the core temperature < 28 °C. This clinical entity is an unusual case in the emergency department and a high mortality rate can occur [1,2,4]. However, with the use of ECLS the survival rates of a DAH with a cardiac arrest can reach 100% [5].

DAH should not be confused with the technically induced hypothermia during for example for cardiovascular surgery. DAH occurs unexpectedly and uncontrolled. DAH is triggered after the exposure in cold environments. The cause of the exposure to a cold environment can also be explained the patient was transferred in the department of neurology and the further clinical course was uneventful. The 7th day after the ECLS explantation the patient was transferred in the department of neurology for further treatment.

Conflict of interest

None to declare.

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