Case Report

Oxygenation (ECMO) and full neurological recovery one week after an out-of-hospital cardiac arrest in a 3-year-old boy: a rare occurrence..

A 3-year-old boy was resuscitated by paramedics at home due to a cardiac arrest. The boy was transferred to the hospital in a state of respiratory and cardiac arrest. On admission, the boy was cyanotic, with no palpable pulses and no respirations. A laryngoscopy revealed a complete obstruction of the airway, and a tracheostomy was performed. The boy was intubated and artificial ventilation was started. A left ventricular assist device (LVAD) was placed, and the ECMO circuit was connected to the ECLS circuit. After 43 minutes of ECMO treatment, the boy was successfully resuscitated and discharged from the hospital.

Introduction

Dear Editor,

Two minutes under water in a river near Milan...

The neckties extracted him from water 43 min after drowning.

14-year-old boy drowned and was trapped

Dear Editor,
tract) was managed with multiple transfusions of red blood cells and fresh frozen.

Fourteen hours after ICU admission, propofol and remifentanil administration was stopped to allow the first neurological assessment which showed the patient comatose, areflexic, with muscular hypertonia at both lower extremities and at the right arm. Only the ciliospinal reflex was evocable after intense stimulation. Propofol infusion was thus restarted.

The second day, acute renal failure requiring renal replacement therapy (highest serum creatinine registered = 2.83 mg/dL) and acute liver failure (highest transaminase value = 4925 U/L; highest total bilirubin value = 6.29 mg/dL) were evident. On the third day of hospitalization, propofol infusion was stopped again to permit a second neurological assessment that showed the patient with open eyes and able to obey to simple orders. After four days, in light of myocardial recovery, ECMO and IABP were removed. The fifth day, brain magnetic resonance was performed and showed thalamic ischemia and signs of reduced cortical diffusion and intracranial hypertension. Furthermore, during the same day amputation of the right leg was performed since irreversible ischemia of the right inferior limb occurred. Pharmacological inotropic support was stopped ten days after hospital admission. On the same day, the patient was transferred to the neurosurgical ICU.

Neurological status progressively improved, after 13 days of hospitalization the patient was awake and neurologically intact, reaching a complete recovery after 37 days of hospitalization, the day in which he was discharged at home. After few months, he went back to school and he speaks the four languages he spoke before the accident.

Patient’s relatives signed a written consent for the scientific use of the patient’s data. Ethics committee approval was waived according to Italian law.

This is the longest mild hypothermic drowning with excellent neurological recovery reported in literature. Indeed, the patient had near one hour and a half CPR before ECMO start; water temperature was 15 °C and patient’s body was found at 29.5 °C. Furthermore, the two years follow up confirmed the absence of neurological deficits. The only report with longer duration of submersion (83 min estimated) happened in icy water with the patient retrieved at 13.8 °C (profound hypothermia). The authors described an excellent neurological outcome even though ten months after the episode described the patient had generalized seizures requiring antiepileptic therapy initiation. Furthermore, in this case the patient was first treated with cardiopulmonary by-pass and only subsequently with ECMO.

This report questions the borders of futility of extracorporeal CPR and when “to stop” it. As a matter of fact, strict cooperation of emergence medical service and ECMO unit allowed this boy “back to life”.

**Source of funding**

The manuscript was supported by departmental funds only.

**Conflicts of interest**

The authors declare no conflict of interest.

**Bibliografia**


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https://doi.org/10.1016/j.medici.2017.06.007
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