Two meters under water in a river near Milan.

A 14-year-old healthy boy drowned was trapped.

Case report

Oxygenation by Extracorporeal Membrane Oxygenation (ECMO) and optimized recovery.

The scenario described above is not unusual. Other cases have been published showing the feasibility of ECMO for the treatment of severe drowning.

Introduction

Dear editor,

Drowning

Drowning resulting after 42 min

Extracorporeal membrane to resuscitate a

14-year-old boy after 42 min

Oxygenation by Extracorporeal Membrane Oxygenation (ECMO) and optimized recovery.

The scenario described above is not unusual. Other cases have been published showing the feasibility of ECMO for the treatment of severe drowning.
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 value of 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”.

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Conflicts of interest

The authors declare no conflict of interest.

Bibliografia


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