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Letter to the Editor

Refractory hyperkalaemic cardiac arrest– What to do first: Treat the reversible cause or initiate E-CPR?



Sir,

The ERC recommends treatment of a reversible cause in refractory cardiac arrest (CA).¹ Additionally, extracorporeal CPR (E-CPR) is also recommended, especially for in-hospital cardiac arrest (IHCA).² We report a prolonged resuscitation due to severe hyperkalaemia and the use of both strategies.

A 5-year old girl with Burkitt lymphoma received rituximab and steroids as induction therapy. Within a few hours we saw a tumor lysis syndrome with severe hyperkalaemia (max 9.2 mmol L⁻¹) despite taking preventive measures. She subsequently developed ventricular fibrillation and cardiopulmonary resuscitation (CPR) was immediately started.

Since hyperkalemia is a reversible cause of cardiac arrest, we started intravenous treatment with furosemide, calcium gluconate, sodium bicarbonate, insulin-dextrose and salbutamol. As this did not result in lowering potassium, we placed a double-lumen central catheter and initiated continuous renal replacement therapy (CRRT) with high dialysate flow rate (6000 mL/min). Approximately 25 min later potassium had fallen to 4.2 mmol L⁻¹. After 70 min of CPR a return of spontaneous circulation (ROSC) for 5 min was obtained, followed by asystolia while potassium started to rise again. Due to the good prognosis of the underlying disease, we decided to escalate to E-CPR. After 168 min of CPR, veno-arterial extracorporeal membrane oxygenation (ECMO) was initiated over the right femoral vessels. Due to blood flow problems we had to stop CRRT for almost 3 h. However, after 12 h we could observe normal pH, lactate and potassium level and our patient could be weaned from ECMO after 3 days (Fig. 1).

While still on ECMO the first chemotherapy cycle was resumed. However, four weeks later the girl developed acute respiratory failure and required veno-venous ECMO for another 12 days. The oncologic therapy is now completed and a complete remission was obtained. Most importantly, the girl showed a full neurologic recovery (Pediatric Cerebral Performance Category 1).

In summary, this case illustrates that rapid initiation of CRRT was technically feasible and resulted in a temporary lowering of potassium. However, due to ongoing massive potassium release caused by tumor lysis, this did not lead to a sustained ROSC. Moreover longer duration of CPR is associated with higher mortality.³ Although our patient had a favorable outcome, we conclude that treatment of severe hyperkalaemia is time-consuming and not always successful. Therefore, early E-CPR in refractory CA due to hyperkalaemia seems to be one of the first options to ensure oxygenation and perfusion.

The informed consent of the patient's parents for publication has been obtained.

Conflict of interest

The authors declare no conflict of interest.

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