Management of Hypokalemia in Cardiac Arrest

**Introduction**

1. Severe hypokalemia may precipitate profound and life-threatening cardiac complications including ventricular tachycardia and asystole.
2. Classical teaching is that in cardiac arrest with non-shockable rhythms the management include to identify and treat the H’s & T’s which include hyper and less commonly hypokalemia.
3. Potassium chloride is the therapy of choice, however, the dose and administration of potassium during cardiac arrest is controversial and limited to case series and case reports.

<table>
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<th>Pharmacology</th>
<th>Overview of Evidence</th>
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<tr>
<td>Dose</td>
<td>Author, year Design/sample size Case &amp; Intervention</td>
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| • 10-20 mEq initial dose followed by institutional protocol | Elmahrouk, 2020 Case report | • 46-year-old post CABG with malignant ventricular arrhythmia on ECMO and intra-aortic balloon pump s/p various antiarrhythmic medications. | • s/p KCl, the rhythm changed to sinus rhythm  
• Pt discharged home on a regular rehabilitation program |
| Administration | Liu, 2020 Case report | • Case: 21 yr old with PMHx hyperthyroidism with thyrotoxic and K+ 1.5 mEq/dL  
• IV bolus KCl 40 mEq/40 mL via the central | • ROSC with stable hemodynamic status at 8 minutes post KCl after 31 total minutes of CPR  
• Pt was extubated on the next day and was discharged without any complication after a total of 5 hospital days |
| • Administer at 2 mEq/min followed by another 10 mEq IV over 5-10 mins | Jouffroy, 2014 Case report | • 50-year-old male with refractory ventricular fibrillation (VF) out-of-hospital cardiac arrest (OHCA) s/p ECMO, 20 shocks, and various antiarrhythmic medications  
• IV KCl 40 mEq via central line | • Less than 1 min later, the patient had sinus cardiac rhythm, and progressively recovered circulatory function  
• patient was discharged on day 11 with a cerebral performance category score of 2. |
| • Onset Immediate  
• Increase in serum potassium is variable  
• Renal excretion 85-90%  
• Removed by dialysis. | Abdulaziz, 2012 Case report | • 23-year-old woman presenting in DKA and cardiac with K+ 1.7 mEq/dL  
• IV KCl 40 mEq via central line | • Immediate reversal of asystole and a return to sinus rhythm.  
• She had full recovery with no residual neurological deficit |
| PK/PD | AHA ACLS Guidelines | • “If cardiac arrest from hypokalemia is imminent (ie, malignant ventricular arrhythmias), rapid replacement of potassium is required. Give an initial infusion of 2 mEq/min, followed by another 10 mEq IV over 5 to 10 minutes.” |
| • Compatible with magnesium sulfate, calcium chloride, epinephrine, amiodarone, lidocaine, and vasopressin  
• Lethal infection dose is ~100+ mEq undiluted as IV push x 1-3  
 o Being replaced to sedatives due to issues with efficacy and ethical issues | | |

References: PMID: 23220438, 912278, 31765017, 24810737, 26004853, 18375090, 14980336, 31422859, 17455994, 16600469

Abbreviations: DKA= diabetic ketoacidosis; K+ = serum potassium; KCl= Potassium Chloride; PMH: past medical history; S/p= status post

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