



Efficacy and Challenges of High-Potassium Microplegia for Myocardial Protection During Cardiopulmonary Bypass at Peshawar Institute of Cardiology

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BACKGROUND

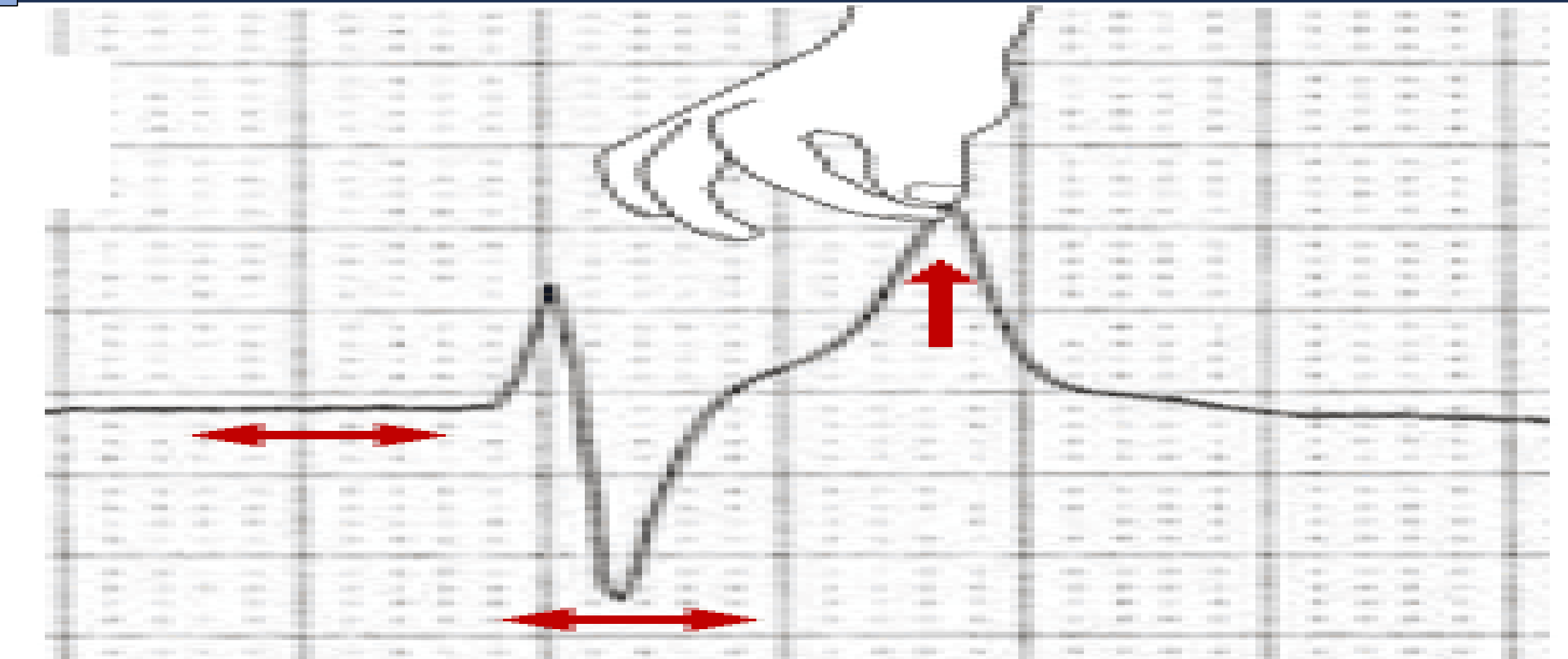
- Microplegia is a cardioplegia technique used to protect the heart during surgery by inducing cardiac arrest.
- At our center, a high-potassium solution is used with additives like lidocaine, magnesium sulfate, and mannitol.
- Despite its general effectiveness, some patients show incomplete cardiac arrest and require additional doses.
- This study investigates the efficacy and limitations of our current microplegia protocol during CPB.

AIMS AND OBJECTIVES

- **Aim:**
To assess the efficacy and challenges of high-potassium microplegia during CPB.
- **Objectives:**
 - Evaluate the effectiveness of myocardial arrest
 - Assess postoperative enzyme levels and arrhythmias
 - Monitor hemodynamic recovery and ICU stay
 - Identify cases with residual cardiac activity

METHOD

- **Study Design:** Prospective observational study
- **Duration:** June 2024 – December 2024
- **Setting:** Peshawar Institute of Cardiology
- **Sample Size:** 100 adult patients undergoing elective cardiac surgery with CPB
- **Microplegia Composition:**
 - Potassium 40 mEq
 - Lidocaine 5 mL (1%)
 - Magnesium sulfate 5 mL
 - Mannitol 10 mL
- **Endpoints:**
 - **Primary:** Effectiveness of myocardial arrest (residual cardiac activity)
 - **Secondary:** Postoperative enzyme levels, arrhythmias, hemodynamic recovery, ICU stay, inotropic support.



RESULTS

Results (Compact Format)

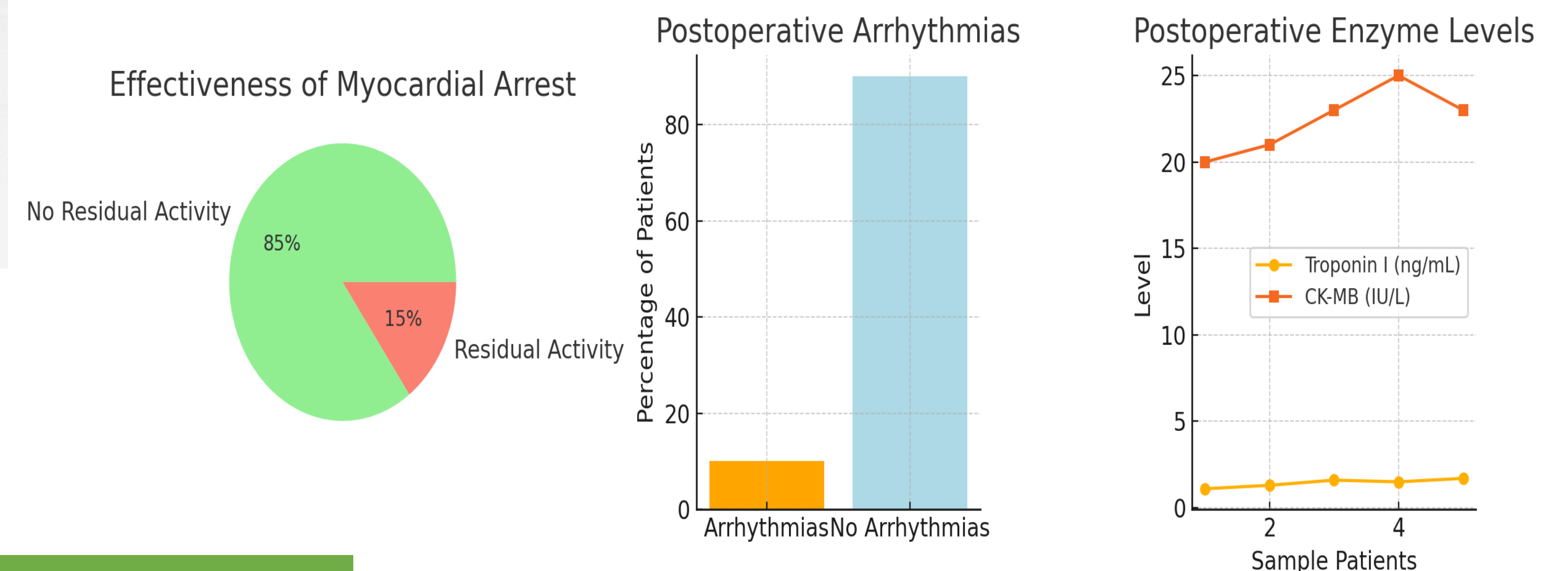
Myocardial arrest: 85% successful, 15% required redosing

Troponin I: 1.5 ± 0.4 ng/mL **CK-MB:** 22.5 ± 5.3 IU/L

Arrhythmias: 10% cases; 95% restored rhythm spontaneously

ICU stay: 3.5 ± 1.0 days **Extubation <24h:** 85%

Inotropic support: needed in 25%



CONCLUSION

High-potassium microplegia provided effective myocardial protection in most patients. However, 15% required additional dosing due to incomplete cardiac arrest. Despite mild myocardial enzyme elevation, outcomes were favorable with low arrhythmia rates, early extubation, and short ICU stays. Optimization of the formula may further enhance reliability.

References

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