EPOSTER:93

Ipoh Specialist Hospital by KPJ

Comparison of Patient Outcomes Between Manual and Mechanical CPR in Code Blue Events in a Private Hospital

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INTRODUCTION

High-quality cardiopulmonary resuscitation (CPR) is crucial for survival in cardiac arrest. Mechanical CPR (mCPR) devices offer consistent chest compressions and reduce rescuer fatigue (Rupp et al., 2023). However, studies show mixed results regarding their effectiveness compared to manual CPR.

BACKGROUND & SETTING

In Ipoh Specialist Hospital, a private hospital with a hospital-wide Code Blue system, Emergency and ICU staff typically manage advanced interventions e.g. airway, defibrillation, and medication administration.

However, manual chest compressions are often performed by the respective unit's staff, particularly in general ward settings. Due to a lower frequency of cardiac arrest events, many staff have limited hands-on real-life resuscitation experience, potentially affecting compression quality.

To address this, our hospital implemented the LUCAS mCPR device into Code Blue protocol since July 2023.

OBJECTIVE

This study aims to compare patient outcomes—return of spontaneous circulation (ROSC) and survival to discharge—between manual CPR and mechanical CPR (mCPR) in in-hospital cardiac arrest.

METHODS

Study Design: Retrospective observational study

Study Period: July 2022 – December 2024

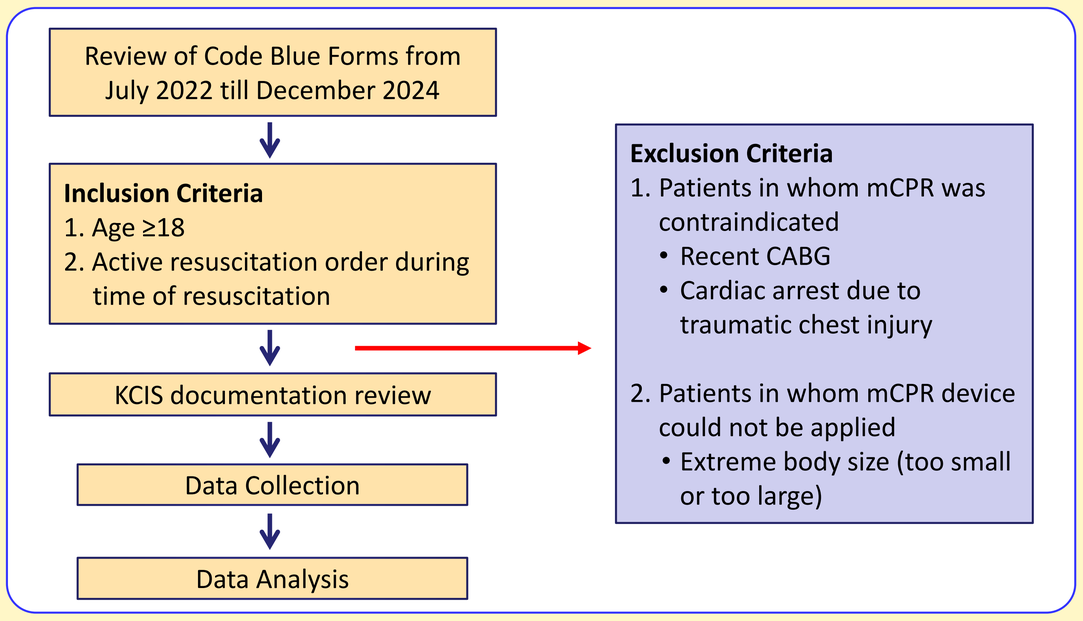
Data source: Code Blue Forms and KPJ Clinical Information System (KCIS)

Outcomes:

- Primary outcome: Return of spontaneous circulation (ROSC)
- Secondary outcome: Survival to discharge

Statistical Analysis:

- ROSC : Chi-square test
- Survival to discharge : Fisher's exact test
- Significance level : $p < 0.05$



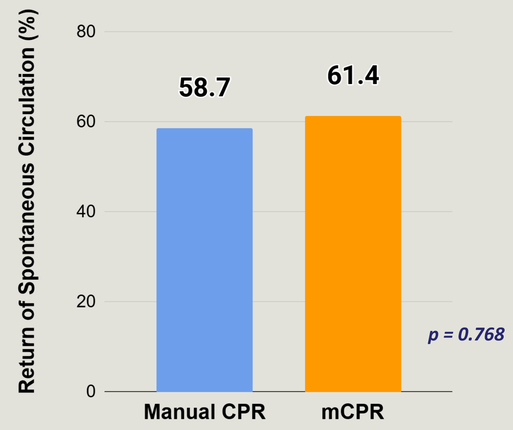
RESULTS

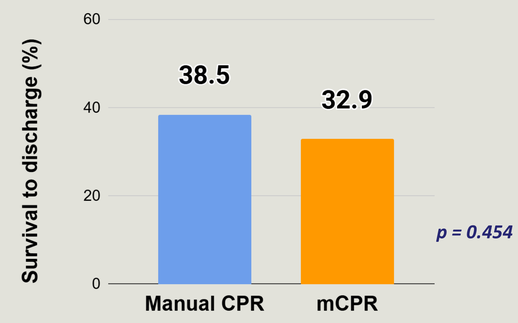
Primary Outcome: Return of Spontaneous Circulation (ROSC)

- Manual CPR : 61 out of 104 patients achieved ROSC (58.7%)
- mCPR : 54 out of 88 patients achieved ROSC (61.4%)

Secondary Outcome: Survival to Discharge

- Manual CPR : 40 out of 104 patients survived to discharge (38.5%).
- mCPR : 29 out of 88 patients survived to discharge (32.9%).





DISCUSSION

ROSC Rates (61.4% mCPR vs. 58.7% manual, p = 0.768):

- mCPR showed a trend towards improved ROSC rates
- This may be attributed to more consistent, high-quality compressions and reduced rescuer fatigue during prolonged resuscitations (Rubertsson et al., 2014)

Survival to Discharge (32.9% mCPR vs. 38.5% manual CPR, p = 0.454):

- Rates were comparable between groups
- The lack of significant difference may be due to:
  - Small sample size
  - Variability in patient conditions and response, and initial rhythms
  - Quality and timing of post-resuscitation care (Soar et al., 2015)

Workflow Benefits of mCPR:

- Delivers consistent CPR quality independent of fatigue or staff experience
- Frees team members for airway, defibrillation, and medication tasks
- Particularly beneficial in staff-limited or less-experienced settings
- May improve overall Code Blue efficiency

LIMITATION

- **Small sample size**: May have limited the statistical power to detect meaningful differences
- **Confounding variables**: Patient comorbidities, downtime before CPR, and initial arrest rhythms were not fully controlled

CONCLUSION

This retrospective observational study demonstrated a modest improvement in return of spontaneous circulation (ROSC) with mechanical CPR (mCPR) compared to manual CPR, and a comparable survival to discharge between the two groups. While these differences were not statistically significant, mCPR may offer workflow and logistical advantages – particularly in staff-limited environments.

Rupp, A. M., Parchen, C. M., Currier, H., Hubble, M. W., & Swanson, M. B. (2023). A randomized pilot study of manual versus mechanical cardiopulmonary resuscitation during extrication from a ski slope. Wilderness & Environmental Medicine, 34(2), 199–206.
Rubertsson, S., Lindgren, E., Smekal, D., et al. (2014). Mechanical chest compressions and simultaneous defibrillation during cardiopulmonary resuscitation. JAMA, 311(1), 53–61.
Soar, J., Nolan, J. P., Böttiger, B. W., et al. (2015). 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Resuscitation, 95, e71–e120.