

中文題目：使用無線心律監測系統於心臟內科病房對於住院期間發生院內心跳停止患者之影響

英文題目：The influence of the wireless ECG monitoring system in cardiovascular ward patients experiencing in-hospital cardiac arrest

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Background

In-hospital cardiac arrest is the dreadful calamity to the critical illness patients among hospitalization. For victims with ventricular fibrillation (VF), the successful rate of resuscitation decline 10% for every one-minute delay of first defibrillation. Documented initial rhythm and medically detected events also influenced the survival of CPR among IHCA patients. Electrocardiographic monitoring in certain patients is recommended by AHA statements. This study would identify the influence of continuous real-time ECG monitoring at initial rhythm detection, CPR duration and resuscitation prognosis of in-hospital cardiac arrest patient in the cardiac ward.

Methods

We conducted a retrospective study from medical records of patients hospitalized to the cardiology ward experienced an in-hospital cardiac arrest receiving cardiopulmonary resuscitation at Chang Gung Memorial Hospital/LinKou, Taiwan from February 2015 to December 2018. The wearable wireless ECG monitoring system was introduced. Patients were classified into two groups, one had the wireless ECG monitoring system for continuously monitoring, and the other was under general care.

The primary outcome measure was survival to discharge. Secondary outcomes included acute success of return of spontaneous circulation (ROSC) for 20 minutes and 24 hours survival

Results

During study period, there were 115 patients suffered from cardiac arrest during hospitalization. There were 73 patients (63%) receiving the wearable wireless monitored. The male patient was predominant (55.7%) and the mean age was 74 years. Over 70% of patients had acute decompensated heart failure with computed average left ventricular ejection fraction around 46%.

The majority of the first documented pulseless rhythms were pulses electrical activity (PEA) (46.6%) or asystole (15.6%); And the hemodynamically compromised ventricular arrhythmia (ventricular tachycardia, VT, or VF) was accounted for over

one third of overall patients (34.8%). The overall mean CPR duration was 32.6 minutes (standard deviation [SD] = 28.3 mins). A slightly shorter resuscitation duration was reported in the monitored group (29.1 minutes) than that in the non-monitored group (38.7 minutes), though not statistically significant.

Substantial difference was observed between the groups with the initial success of resuscitation account for 67.1% in the monitored group and 40.5% in the non-monitored group ($p = 0.005$). Still, 49.3% patients survived for 24 hours in the monitored group, but only 26.2% patients had survival in the non-monitored group ($p = 0.015$). However, no significant difference of survival to discharge was observed ($p = 0.498$). The monitored group was associated with higher likelihood of ROSC >20 mins or 24-hour survival (odds ratio [OR], 3.00 and 2.74; 95% confidence interval [CI], 1.37 to 6.59 and 1.20 to 6.27). The effect of monitor on ROSC >20 mins or 24-hour survival was still observed after adjusting for arrhythmia and first documented rhythm (OR, 2.71 and 2.50; 95% CI, 1.19 to 6.17 and 1.05 to 5.94).

Forty patients presenting first documented pulseless ventricular arrhythmia (VT/VF) had higher rate of initially successful resuscitation (70%), 24-hour survival (55%), and survival to discharge (40%) in contrast to seventy-five patients demonstrating PEA or asystole. The mean CPR duration was notably shorter in the survival groups versus to non-survival groups.

Conclusions

The ECG monitoring system may avail to the CPR outcomes in patients posing high cardiogenic event risk, suffering an in-hospital cardiac arrest. Patients presented with an initial shockable rhythm and endured a shorter resuscitation duration are prospect of survival to discharge.