Clinical Alert System to Reduce Hospital Unexpected Cardiac Arrest Event Incidence

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Background

Unexpected cardiac arrest (UCA) is a serious adverse event that is not uncommonly seen in hospitals. The statistics of Taiwan Patient Safety Reporting System (2015) indicated that more than 80% of patients who experienced UCA suffered serious adverse outcomes. Studies have shown that 60 to 70% of patients who experienced cardiac arrest, had been symptomatic 6-8 hours before the cardiac arrest event. Yet, only 25% of them were detected. Literatures also suggested early detection and notification of clinical instability in a patient by nurses to prompt earlier clinical intervention could reduce the incidence of and mortality from unexpected cardiac arrest in hospitals.

Purpose

The purpose of the paper was to investigate the effect of a hospital-wide clinical alert system (CAS) on the rate of UAC.

Methods

A retrospective analysis of medical records was performed to compare the incidence of UAC before and after the implantation of the CAS. The study was conducted at a 350-bed teaching hospital in central Taiwan. Medical records of all adult patients admitted to the non-ICU wards of the hospital from Jan. 1, 2010, to Dec. 31, 2015 were reviewed. Patients who had signed do-not-resuscitate order were excluded. We measured the incidence of cardiac arrests, unplanned ICU admissions, and the total hospital mortality rate occurring over the study period. While it may take up to 16 months to see the positive effect, the deployment of a clinical alert system may help in early recognition and response to patients’ deterioration to further prevent UCA. Nurses should familiarize with the important clinical alerting signs and symptoms of patients; so that nurses could initiate early response to patients’ deterioration and could further help prevent UCA.

The results

There were 557 CAS calls during the study period. In the 36 months before the CAS began, the death rate was 0.0152%. In the subsequent 36 months, that death rate was 0.0237. A Bai-Perron method identified the structural break date to be the 4th month of 2015 (F = 26.1732, p < .01) (Fig. 1). This result was proved by the Sequential F tests (F = 26.17); a value higher than 10% critical value (7.42) indicated that the null hypothesis was rejected (Table 1). In addition, the result of a order logistic regression showed three possible determinants of clinical outcomes after CAS; they were comorbidity ≥ 4 (p = .0054); presentation of neurological sign and symptom (p = .0000) and presentation of cardio-pulmonary sign and symptom (p = .0000) (Table 2).

Conclusion

While it may take up to 16 months to see the positive effect, the deployment of a clinical alert system may help in early recognition and response to patients’ deterioration to further prevent UCA. Nurses should familiarize with the important clinical alerting signs and symptoms of patients; so that nurses could initiate early response to patients’ deterioration and could further help prevent UCA.

Keywords: Clinical Alert System (CAS); Unexpected Cardiac Arrest Event; Incidence Density