BACKGROUND

Data were obtained from the Critical Care Information System (CCIS), a provincial critical care near-real-time database in which 203 critical care units across 111 hospitals in Ontario enter data daily. CCIS is the most comprehensive source of provincial information on access to critical care, quality of care, and outcomes for critically ill patients. Current study selected all 67 medical-surgical Level-3 ICUs.

Adult patients admitted between July 1st 2013 and June 30th 2018 with multiple organ dysfunction score (MODS) recorded at admission were included in this study. The in-hospital mortality risk was assessed with admissions on weekdays (Monday to Friday) and daytime compared to weekends and afterhours:

Daytime (Mon-Fri, 7:00-21:59)

After hours (Mon-Fri, 22:00-6:59)

Weekend (Sat 7:00 – Mon 6:59)

Severity of illness at admission was assessed using MODS. Age, gender, time and date of ICU admission, incidence of ventilator associated pneumonia (VAP) and central line insertion (CLI) for each patient. Descriptive analysis was done for frequencies and percentages for categorical variables; and means, medians and standard deviations for continuous variables. Chi-square tests were done to compare the categorical variables. ICU mortality was calculated from the time of admission to the time of death from any cause was modeled using Poisson regression model, presented as an incidence rate ratio to adjust modelling death event: MODS, VAP, CLI, age, gender and hospital type. Analysis was performed using SAS version 9.4.

RESULTS

Multivariable Analysis:

Poisson regression model of ICU mortality related to admission hours adjusted by MODS, VAP, CLI, age, gender and admission hospital type showed that patients admitted during weekends had significantly higher odds of dying (OR 1.13, 95%CI [1.10, 1.16]) followed by those admitted during hours (OR: 1.08 95%CI [1.05, 1.11]) as compared to those who were admitted during daytime hours (Figure 3).

The odds of dying significantly increased if the patient had received VAP (OR:1.28 [1.06, 1.54]) and developed CLI (OR:1.31 [1.05, 1.63]) during the ICU stay.

The odds of dying also increased if the patient was admitted in teaching hospital (OR: 1.13 [1.1, 1.15]) as compared to that in community hospital.

The odds dying for male patients which were admitted afterhours was lower as compared to women (OR: 0.91 [0.89, 0.94]).

Patients’ age significantly increased the odds of mortality.

CONCLUSIONS

Further research should focus on evaluating modifiable factors such as staffing structure, organizational model, capacity and ICU protocols to introduce improved guidelines in critical care delivery.

The individual hospital level analysis may performed to improve ICU mortality during afterhours and weekends.

This research may also be performed to investigate further weekend admissions and afterhours admissions separately.

In order to better understand the underlying reasons behind variations in mortality across the week, further analysis of mortality by cause and service quality indicators would be required.

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REFERENCES