Factors Associated with Intensive Care Unit Admission Refusal

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Abstract

Background: The need for intensive care exceeds its availability most times because resources are limited. Our objectives were to determine the incidence of admission refusal and factors associated with such in our Intensive Care Unit (ICU). **Methods:** The following information was obtained from patients referred to our ICU over a 6-week period: age, gender, date and time of referral, source of referral, reason for referral, whether ICU was full or not full at the time of referral, and modified early warning score (MEWS). Others included; whether admitted or not, and if not admitted, reasons for admission refusal. Binomial logistic regression analysis was used to determine predictors of ICU admission refusal. **Results:** Patients admitted and those denied admission were 37(50.7%) and 36(49.3%) respectively. Following univariate analysis, there were no statistical differences in the age and MEWS of patients in the admitted and not admitted groups respectively. Refusal was highest for sepsis (80%) and respiratory failure (71.4%) and lowest for severe head injury (18.2%), no difference was found in the MEWS for patients with sepsis and those with severe head injury. Lack of ICU bed was the only independent predictor of ICU admission refusal. **Conclusions:** The crude ICU admission refusal rate of 49.3% and unavailability of ICU bed independently predicted ICU admission refusal. To ensure reduction in ICU admission refusals, the ratio of ICU beds over the population must be appropriate.

Keywords: ICU, Admission refusal, Bed availability.

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Introduction

The Intensive Care Unit (ICU) remains a critical part of efficient health care delivery. Despite the high cost for critical care services, the need for intensive care often exceeds its availability most times because of limited resources (1, 2). Sometimes, request for admission into the ICU are turned down because of many patient-related or organizational factors. Some studies have identified; older age, diagnosis, presence of co-morbidities, and triage by a senior intensivist as predictors of admission refusal. Bed unavailability was a strong factor in these studies. (3, 4) The aim of this study was to determine the incidence and factors associated with ICU admission refusal.

Methods

This was a prospective observational study conducted in the 12-bed general ICU of the University College Hospital, Ibadan between February and April 2015 following institutional ethical research board approval. All referrals for ICU admission were collated daily and the research assistant then visited the ICU or the Emergency Department the following morning to obtain necessary information from the ICU chart or case notes from referred patients. The following data were prospectively recorded; Age, gender, date and time of referral, source of referral, reason for referral, number of beds available in the ICU at the time of referral, modified early warning score (MEWS), whether admitted or not, and if not admitted, reasons for admission refusal. MEWS was employed because it

easy to assess, and increasing score is said to correlate with increased likelihood of critical care admission (5). All requests for ICU admission coming from each department within the hospital were included. Postoperative patients for elective ICU admissions were excluded. Binomial logistic regression analysis was used to determine predictors of admission refusal. A p-value of < 0.05 was considered significant.

Results

Ninety-nine referrals were received during the study period; however due to missing information only data from 73 patients were included in the analysis. Two weeks during the period of study, only six out of twelve beds were available in the ICU because of routine fumigation exercises. The number of patients admitted and those denied admission were 37(50.7%) and 36(49.3%) respectively. Following univariate analysis, there was no statistical difference in the age (37.65±18.48 years vs. 39.63±26.52 years) and MEWS (5.76±1.92 vs.5.94±1.51) of patients in the admitted and not admitted group respectively (p=0.71 and p=0.65). Male gender (75.7 vs. 50.0) and referrals from the Emergency department (78.4 vs. 50.0) were significantly higher in the admitted group compared to those not admitted (p=0.02 and p=0.01) (Table 1). Refusal was highest for sepsis (80%) and lowest for severe head injury (SHI) (18.2%). No difference was found in the MEWS for patients with sepsis (6.60±1.35) and SHI (6.09±1.41) (p=0.35) (Table 2). The commonest reason for admission refusal was unavailability of ICU beds (81%). Other reasons included, 5% patient too well to require ICU admission, 5% patient demise, 3% no available patient monitor, 3% family refusal and 3% unavailability of mechanical ventilator. Logistic regression revealed lack of ICU bed as the only independent predictor of ICU admission refusal (OR 16.30; 95% CI 3.65–75.42; p =0.0001) (Table 3).

Discussion

The proportion of ICU admission refusal was about 50%, which is comparable to other authors 24-57%(6, 7). Though there were more males and patients with severe head injury in the admitted group, patient's age, reasons for ICU admission and MEWS were not significantly associated with a decision to refuse admission, contrary to other studies (3, 8).

Table 1: Univariate Analysis of Factors Associated with Intensive Care Unit (ICU) Admission or Refusal

Variable	Admitted n = 36	Refused n = 37	P value*
Age(yrs.)	37.65±18.48	39.63±26.52	0.71
Gender			
Male	28(75.7)	18(50.0)	0.02
Female	9(24.3)	18(50.0)	
Reason for referral			
CVA	5(13.5)	4(11.1)	0.00
Respiratory	6(16.2)	18(41.7)	
failure	2(5.4)	8(22.2)	
Sepsis	18(48.6)	4(11.1)	
SHI	2(5.4)	2(5.6)	
Neurologic	1(2.7)	2(5.6)	
SCD crisis	3(8.1)	1(2.8)	
CVS failure			
Admission source	29(78.4)	18(50.0)	0.01
Emergency	8(21.6)	18(50.0)	
Ward			
Unit status	8(21.6)	34(94.4)	0.00
Full	29(78.4)	2(5.6)	
Not full			
MEWS	5.76±1.92	5.94±1.51	0.65

CVA, Cerebrovascular accident; MEWS, Modified Early Warning Score; SCD, Sickle Cell Disease; SHI, Severe Head Injury.
*p value ≤ 0.05

Table 2: Mean Modified Early Warning Score for Reasons for ICU Referral.

Reason for ICU referral	Mean Modified Early Warning Score
Cerebrovascular Accident	6.67±2.00
Respiratory failure	5.33±1.68
Sepsis	6.60±1.35
Severe Head Injury	6.09±1.41
Neurologic disease	6.25±1.71
Sickle cell disease crisis	4.33±0.58
Cardiovascular failure	4.25±2.63

ICU, Intensive Care Unit.

Table 3: Binary Logistic regression to Identify Factors Independently Associated with ICU Refusal.

Variable	Odd's ratio	P-value
Age	0.14	0.71
Reason for referral	3.88	0.05
Source of referral	2.96	0.09
Unavailable bed	16.58	0.0001
MEWS	1.24	0.27

MEWS, Modified Early Warning Score.

Higher numbers of males were admitted probably because severe head injury patients constituted the majority; and it is known fact that males form bulk of patients with SHI. However, the reason/s for admitting more patients with severe head injury as observed in this study was not apparent. The likelihood of the ICU personnel being more confident with providing better care for patients with severe head injury cannot be ruled out especially because the center is a designated neurosciences center.

Bed unavailability mostly predicted ICU admission refusal in agreement with similar studies (3,4). However, the bed unavailability of 80% is higher than that reported by Metcalfe et al (18%) Lapichino et al (15.1%) and Robert et al (34%) (10). The high bed unavailability was probably due to the closure of one half of the ICU for routine fumigation during part of this study. The true value is likely to be much lower than what we found in this review. We observed that ICU admission was justified in 95% of patients referred. This may suggest indirectly that a highly objective tool was employed during patient assessment for ICU referral. This, in addition to using effective ICU admission policies is important to help reduce inappropriate ICU admission (11).Unavailability of monitoring facilities, ventilators and family refusal were also identified as factors associated with ICU admission refusal. These are often due to low health care financing and out of pocket payment for ICU care leading to inadequate provision of necessary facilities and care in the ICU. At times, despite counseling about the benefit of ICU care, family members are usually left with no option but to decide against such admission because of the huge cost of care in the ICU. ICU admission refusal due to shortage of beds has been associated with higher risk of early mortality and delayed ICU admission because of a full unit has been associated with significantly higher risk of death compared with patients admitted at first referral (10).To reduce ICU admission refusals, the ratio of ICU beds over the population must be appropriate. A study from the US demonstrated that having more beds per population allowed for more patients to be transferred directly to the ICU from the accident and emergency room, rather than receiving care on a general ward first (12). Also another study showed that the relatively fewer ICU beds in the UK is responsible for low provision of intensive care services (13). This assertion was supported by a number of studies which showed many patients were denied intensive care due to a lack of beds, (8) discharged from the ICU prematurely (14), and a reduction in mortality when more ICU beds were built throughout the UK (13).

Conclusion

Crude ICU admission refusal rate was 49.3%. We found higher ICU admission refusal in patients referred from the ward and referrals for sepsis care and respiratory support in contrast to those from accident and emergency room and patients with severe head injury. Only unavailability of ICU bed independently predicted ICU admission refusal. Data on ICU admission refusal may help to assess ICU efficiency. Further work is needed to determine outcome in patients refused ICU admission.

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