Working practices and patient outcome in the intensive care unit of the University of Benin Teaching Hospital

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ABSTRACT

The working practices and outcome of patients admitted into the intensive care unit (ICU) of the University of Benin Teaching Hospital (UBTH), a tertiary institution, was examined. The conditions under which these were carried out were reviewed over a 15year period (January 1985 to December 1999). We found that the admission rate was 53.3% with post-surgical patients in the majority (50.4%). One hundred and thirteen patients needed respiratory support and were ventilated (14.1%). The incidence of tracheostomy was 6.4, while the mean length of stay in the ICU was 7.1 days. Outcome of patients admitted into the unit included a mortality rate of 35.1%, 50% direct transfers to the lying-in wards, 2.8% referrals to other tertiary institutions for more specialised care, and 12.1% discharged home! Patients who were not ill enough to require admission into the ICU were found in the study. In addition, unnecessary long stay of patients in the ICU made their management not to be cost-effective. We conclude that there is a need to streamline and enforce admission criteria in the intensive care unit in order to reduce the rate of unnecessary admissions into the unit. Discharge criteria should also be strictly adhered to, thereby making the ICU services more cost-effective. There is a need for a high dependency unit as a step down from the ICU to take care of postsurgical cases that are not critically ill.

KEY WORDS: Working practices, patient outcome, intensive care unit

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INTRODUCTION

The intensive care unit (ICU) is a health care delivery service for patients who are very ill with potentially recoverable diseases. They can benefit from more detailed observation, monitoring and treatment than is generally available in the standard lying-in ward or department.¹ It comprises 1–2% of the total number of beds available in the hospital. The intensive care unit at the University of Benin Teaching Hospital (UBTH) is a three-bed unit comprising 0.7% of the total of 455 beds available in the hospital. It is a general intensive care unit that accepts adult and paediatric patients from all specialties in the hospital and the sub-region except neonates who are admitted into a special care baby unit (SCBU). The consultant under whom the patient was admitted for the primary diseases provides medical care. Hunter², and Mushin and Lunn have recommended this system. The anaesthetist provides care for critically ill post-surgical patients and those needing airway management, special nutrition and therapy including the control of infection.

The diagnosis and treatment of patients with acute life-threatening diseases with a purpose to restore them to their previous health and quality of life⁴ is the goal of the ICU. Data regarding working practices and outcome in the ICU is well-documented³⁻⁷ but few in Africa, although it has been described.^{8,9}

This is an updated review examining the working practices and patient outcome in the ICU at UBTH with a view to determining morbidity and admission criteria pattern and making comparisons. The cost-effectiveness of ICU management was also examined.

METHOD

A fifteen-year retrospective study was carried out from January 1985 to December 1999. The study carried out in October 2002 consisted of looking at the master registry and daily records of patients admitted in the intensive care unit of UBTH for that period. The case notes, where available, were also examined. A record of the patients' demographic characteristics, duration of stay in the ICU, working practices and pattern of morbidity and mortality were made. The data is presented as frequency (%) or mean and histograms. Categorical data was analysed using the chi square test where appropriate.

RESULTS

A total of 800 patients were admitted into the ICU for the period of fifteen years. This consisted of 307 (38. 4%) females and 493 (61.6%) males. Two hundred and sixteen of them (27%) were paediatric patients. The admission rate was 53.3%. The frequency of admission into the intensive care unit in comparison to the total number of admissions in UBTH for that period (120,629) showed the mean bed occupancy rate to be 29.8% (calculated as the % of occupied beds to the number of available beds in hospital). The duration of stay in the unit ranged from 0 to 80 days with a mean of 7.1 ± 4.8 days.

Demographic data as it relates to martial status showed 415 (51.9%) of them as married, 341 (42.6%) as single and 44 (5.5%) with unspecified marital status. Paediatric patients constituted 63.3% (216) of those who were single. The mean age of the patients was 31.2 years (Table 1).

The morbidity pattern of the patients showed post-surgical patients to be in the majority (50.4%) (Figure 1), followed by trauma patients (18.5%). This was followed by patients with pulmonary disease, and post-obstetric and gynaecological patients, who numbered 68 each (8.5%). Morbidity was low in patients with cardiovascular disease (3.3%) and organ failure (3.1%). There was a miscellaneous group (2.1%) that included enteric and malaria fever, while five patients were moribund (0.6%).

Data on working practices showed that patients in the ICU generally had physiotherapy and enteral feeding in addition to specific management for their morbidities. One hundred and thirteen (14.1%) patients needed technological support, i.e., respiratory support, and they were ventilated. Other admission criteria for patients in the unit included special therapy, i.e., tracheostomies (6.4%) and control of infection especially in patients with burns (3.4%), special monitoring (0.6%), critical illness (37.6%), high

Age (years)	Male	Female	Total	% of grand total
0-10	95	62	157	19.6
11-20	63	42	105	13.1
21-30	73	70	143	17.9
31-40	69	56	125	15.6
41-50	64	29	93	11.6
51-60	56	18	74	9.3
61-70	25	12	37	4.6
71-80	20	4	24	3.0
81-90	6	2	8	1.0
91–100	1	0	1	0.1
101-110	1	0	1	0.1
Unspecified	20	12	32	4.0
Total	493 (61.6)	307 (38.4)	800	99.9

Table 1Age and sex distribution of patients at the ICU

df = 20; p < 0.05

Figure 1 Morbidity pattern of patients at the ICU

Figure 2 Outcome of patients admitted at the ICU

dependency care (25.4%) and social factors such as very important persons (VIP) and relatives of doctors (12.5%). Thirty two (62.8%) tracheos-tomies were indicated for amelioration of airway obstruction and 19 (37.3%) for bronchial toilet especially in children.

The outcome of patients admitted into the intensive care unit (Figure 2) shows a mortality rate of 35.1%, with 2.8% referrals to other hospitals, 12.1% discharged home and 50% transfer to the general lying-in wards.

Mortality was highest in the 21–40 years group (32%). This was followed by the 0–20 years age group (9.4%), which included 57 paediatric patients aged 0–17 years (Figure 3).

DISCUSSION

Data regarding working practices and outcome of patients admitted in the intensive care unit is poor in Africa and even in Europe. There is paucity of such reports in literature, although they have been described.^{1,5-9} The unit described is a general intensive care unit which accepts adult and paediatric patients from all specialties in the hospital and the sub-region. Criteria for admission into the unit include patients needing technological support such as mechanical ventilation and/ or invasive monitoring.¹⁰ It also includes patients who are critically ill but recoverable who need care other than that available in the general wards. In this study there were patients with such criteria using conventional subjective clinical judgment advocated by Marks and colleagues.¹¹ However, untenable criteria such as social factors, i.e., very important persons (VIP) and post-surgical patients needing care in a high dependency unit, were found to be admitted into the unit. This arises largely from the acute shortage of nursing personnel to run the six-bed high dependency bay in each ward in the hospital and the non-availability of a VIP annex. It is therefore not surprising that morbidity was highest in post-surgical patients (50.4%). Patients needing respiratory support were fewer (14.1%) compared to those needing respiratory support in Foulkes Crabbe's⁸ study (22.9%). The duration of stay in the ICU is an index of severity of morbidity, although it cannot be interpreted in isolation. In the study, the mean duration of stay was 7.1 days, in contrast to 3.6 days reported by Cohen et al.⁵

This is influenced by the non-enforcement of the discharge criteria, as 97 patients (12.1%) were discharged home straight from

Figure 3 Age and mortality

the ICU! This shows the improper use of the ICU as not only a high dependency unit but also as a general ward with full recovery of patients! Morbidity is broadly defined as the health-related quality of life in or out of hospital.¹² It is affected by previous health status and residual disability. In the study, patients who were not ill enough to require ICU admission (37.9%) were found. However, the study still revealed that morbidity is high in trauma patients needing intensive care. This agrees with earlier reports.¹³

The eventual mortality was 35.1%, which was similar to that found in other studies.^{6,8} This emphasises the need for accurate prediction of outcome if inappropriate transfers are to be avoided in the ICU. In this study, five moribund patients were admitted in the ICU. The use of APACHE II scoring system (acute physiology and chronic health evaluation)¹⁴, which allows some comparison of the severity of illness and outcome instead of clinical judgment, would have been more appropriate.

The highest mortality recorded was in the 21-40 years age group, followed by the 0-20 years age group. For the first group, the high mortality could be explained by the fact that this is a mobile age group and trauma found to be the next highest cause of morbidity in the study is therefore common. For the 0-20 years age group, 76% were paediatric, therefore, mortality can be reduced by having

a paediatric intensive care unit as found in Shann's study.¹⁵

It should be emphasised that the high mortality in the paediatric age group is due to the high incidence of congenital anomalies and accidental trauma in the group requiring surgical intervention. The legal definition of age was used to select patients belonging to the group.^{16,17}

CONCLUSION

A review of the intensive care working practices and patient outcome at the University of Benin Teaching Hospital revealed social factors and level of care to be among criteria for admission of patients. This should be discouraged by strict adherence to admission criteria. Long stay patients who had fully recovered were found in the ICU. Enforcement of discharge criteria should reduce this and enhance cost-effective management of patients in the ICU. There is also a need to provide a high dependency unit as a step-down from the ICU or to improve the staff strength of nurses in the high dependency bays of the wards to take care of the post-surgical cases. Finally, there is need for a VIP annex to allow for the much-needed ratio of 1:1 nurse to patient care for those who can afford it. These will make services in the intensive care unit more cost-effective.

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