Disease Patterns and Drugs Load of the ICU Patients in a Tertiary Level Teaching Hospital

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Abstract: Objective: The objective of the present study was to investigate the disease pattern and drugs load of the ICU patients at a tertiary level teaching hospital in Mymensingh. Methods and Materials: It was a descriptive type of observational study conducted in the intensive care unit of Mymensingh Medical College Hospital, Mymensingh during the period of June 2016 to December 2016. Purposive sampling was adopted for collecting data. All the admitted ICU patients were included in this study. The study was approved by the institutional ethical committee. Results: Most of the patients in the ICU belonged to the elder age group >60 years and male patients were predominant than the female ones. Average duration of stay in ICU was 4.35 days. Admissions with respiratory system disorders were more common in ICU and in the present study it revealed that 31.68% of the reported cases belonged to respiratory problems. Average number of drugs per prescription was 6.46. Average number of anti-microbial drugs per prescription was 1.38. Conclusion: Respiratory system related admissions were common in ICU. The average number of drugs per prescription was less than the other studies. Prescription protocols need to be addressed to guide appropriate use of drugs in the ICU setting.

Keywords: ICU Patients, Drugs Load, Disease Patterns

1. Introduction

The modern concept of intensive care is said to have been pioneered by an anesthetist in Denmark over half a century ago during the polio pandemic. Since then, intensive care units (ICUs) have significantly improved the quality of care and outcomes of critically ill and injured patients, predominantly in high-resource settings [1]. Patients admitted to the intensive care unit are seriously ill and often suffer from chronic illnesses. Intensive care is appropriate for patients requiring or likely to require advanced respiratory support, patients requiring support of two or more organ systems, and patients with chronic impairment of one or more organ systems who also require support for an acute reversible failure of another organ. Early referral is particularly important [2]. These patients receive multiple medications from a variety of pharmacological classes due to life threatening illnesses [3]. Critically ill patients generally need high usage of antibiotics; it is challenging to use them safely with a control on adverse drug reactions (ADRs) and drug interactions (DIs). Drug interactions are one of the highest occurring drug-related problems in the ICU. It is important for the healthcare providers to work as a team to reach better medication therapy outcomes for patients. In addition, pharmacists can serve as a resource to other healthcare providers and payers to assure safe, appropriate, and cost-effective medication use [4]. Different studies correlated multiple factors with mortality and duration of hospitalization in the ICU. Length of stay in the ICU was associated with the number of drug classes received (p =

0.0002) but not with the type of drug used [5]. A study reported that antibiotic therapy correlates with hospital mortality in patients staying for more than 24 hrs in a surgical ICU [6]. Even with the presence of drug use guidelines and policies in the ICU, it might be difficult to apply due to the patient-specific disease state and physician medication preferences. Therefore, number of drugs prescribed in the ICU need to be urgently addressed [7].

2. Objectives

The aim of the present study was to investigate the diagnosis and drugs load of the ICU patients at a tertiary level teaching hospital in Mymensingh. The study of prescribing patterns seeks to monitor, evaluate and suggest modifications in practitioners prescribing habits so as to make medical care rational.

3. Materials and Methods

It was an observational type of descriptive study, conducted in the Mymensingh Medical college hospital, Mymensingh, during the study period of June 2016 to December 2016. Purposive sampling was adopted for collecting data. All the admitted ICU patients were included in this study. Incomplete data sheet of the patients were excluded from the study. The study was approved by the institutional ethical committee. To evaluate the diagnosis and drugs load of the ICU patients, a data collection sheet was prepared. The data collection sheet contain details such as demographics, diagnosis, duration of stay in the ICU, number of drugs and number of antimicrobial agents per prescription. Total 101 case records were studied during the study period. The data was obtained from the patient's prescription. All filled questionnaires were entered into the computer for subsequent analysis using SPSS method version 20.1.

4. Results

According to table 1 the age structures of the patients have been categorized in years into three groups. Overall 38 (37.62%) patients were in <40 years old while 21 (20.79%) patients were 40-60 years old, 42 (41.58%) patients belong to >60 years age group. Most patients belonged to the elder age group >60 years. According to figure 1 Total numbers of patients both male and female were 101. It comprised of 65 (64.44%) male and 36 (35.56%) female. Male patients are more than the female patients in ICU. According to table 2 32 patients admitted in ICU due to respiratory disease, 20 patients admitted due to complication of DM, 18 patients admitted due to cardiovascular disease, 15 patients due to CVD, 11 patients due to renal disease, 9 patients due to pregnancy related complication, 5 patients due to post operative complication, 5 patients due to electrolyte imbalance and 30 patients due to other cause. According to table 3 average duration of stay in ICU was 4.35 days. Average number of drugs per prescription was 6.46. Average number of anti-microbial drugs per prescription was 1.38.
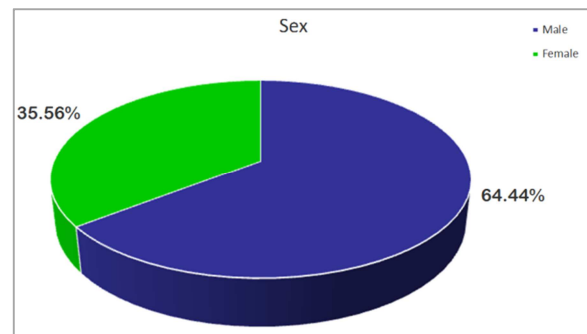

Figure 1. *Pie chart showing percentage of sex distribution of patient.*

Table 1. *Age distribution of the study population (n=101).*

Age in years (Range 08-98 years)	Frequency	Percentage (%)
<40	38	37.62
40-60	21	20.79
>60	42	41.58
Total	101	100
Mean age	48.86 years	

Table 2. *Diagnosis of the ICU patient. (n=101).*

Diagnosis	Frequency	Percentage
Respiratory disease (BA, COPD, Resp. failure, Aspiration pneumonia)	32	31.68
Complication of DM	20	19.80
Cardiovascular Disease (Hypotensive shock, LVF, HTN)	18	17.82
CVD	15	14.85
Poisoning (OPC poisoning, Snake bite)	12	11.88
Renal disease (RF, CKD, AKI)	11	10.89
Pregnancy related complication	09	8.91
Postoperative complication	05	4.95
Electrolyte imbalance	05	4.95
Others (RTA, Hanging, Status epilepticus, Carcinoma, GBS, TB etc)	30	29.70

*patients may suffer from more than one disease.

Table 3. *Different parameter of ICU patients.*

Parameter	Mean ± SD
Duration of stay in ICU	4.35±4.85
Number of drugs per prescription	6.46±1.93
Number of Antimicrobial agents per prescription	1.37±0.63

5. Discussion

Patients admitted in the ICU invariably suffer from chronic and critical illness. It is difficult to treat patients in the ICU with multiple co-morbidities with less number of drugs as they require drugs for treatment of specific condition as well as for prophylaxis, but it is also essential to keep a balance between the number of drugs and effective pharmacotherapy [8]. This study showed that male patients were more in ICU than the female patients. In the Bangladesh scenario it is noticed that female populations are reluctant to utilize health care facilities even if they are critically ill and especially by the lower socio-economic strata. Similar results were obtained in the study conducted by John et al. (2011) [3]. In our study, the most common age group was greater than 60 years, which is different from a study in India where the common age group was 36-55 years [3]. In our study mean age was 48.86 years. Dissimilar results were obtained in the study conducted by Rajathilagam et al. (2018) [9]. In their study they stated that mean age of the ICU patients was 54.95 years. Respiratory system related admissions were common in ICU and in the present study it showed that 31.68% of the reported cases belong to Respiratory system. Similar result was seen in other study done by Drupad et al. (2016) [10]. In another study Infective etiology was the most common factor for ICU admission followed by cardiac disorders [11]. In our study average duration of ICU stay was 4.35 days. Near to similar results were obtained in the study conducted by Hanssens et al. (2005) where average duration of ICU stay was 5.8 days [12]. Dissimilar results were seen in the study conducted by Alharthi et al. (2019). In their study they stated that Patients' average length of stay in ICU was 7.4 days [13]. ICU is the place where highly fatal, complicated and variety of cases are seen. In our study average number of drugs prescribed in the ICU was 6.46. In another study the number was 7.5 [14]. In our study the average number of antimicrobial agents per prescription was 1.37 which is lower than the number (3.36 per prescription) reported by Mahajan et al. (2013) [15].

6. Conclusion

Based on the results, we conclude that, Respiratory system related admissions were common in ICU. The average number of drugs in our study was less than or comparable to that reported in other studies. Average number of drugs per person is an important index of prescription audit. It is preferable to keep the mean number of drugs per prescription as low as possible, since higher figures always lead to increased risk of drug interaction, development of bacterial resistance, increased hospital cost. Feedback from this study would help both the prescribers and institutional authorities to review their prescribing practices and modify if necessary to facilitate better health care delivery.

Conflict of Interest

Authors declare no conflict of Interest.

Authors Contributions

Data gathering and idea owner of this study: Kartick Chanda Shaha.

Study design: Kartick Chanda Shaha, Afroza Sharmin.

Data gathering: Kartick Chanda Shaha, Md. Rezaul Karim.

Writing and submitting manuscript: Kartick Chanda Shaha, Afroza Sharmin.

Editing and approval of final draft: Kartick Chanda Shaha, Bhagyoshree Karmokar Jyoti.

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