RESEARCH ARTICLE

The Evaluation of Factors Affecting on Patient Admission from Operating Room to Intensive Care Unit in University Teaching Hospital

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Background: By consideration of clinical predictors and true way for transfer of patient from the operating room (OR), it can be prevented of complications and thus mortality rate reduced. Thus, the study aimed to investigate clinical predictors of admitted cases from OR to ICU.

Methods: In this study250 patients were transferred to ICU. Data such as underlying diseases, prior reservation for transferring to ICU, unexpected decision for transferring, problems in OR, multi-trauma, and other effective causes of transferring were analyzed.

Results: Of 250 subjects, 144(57.6%) were male. The four major causes of admission to ICU follow as trauma (43.6%), respiratory problems (20.4%), bleeding (19.6%) and postoperative care (16.4%). The most common causes in traumatic patients included brain trauma (60 cases), multiple trauma (32 cases), and abdominal trauma (8 cases).

Conclusion: The viewpoint of an anesthesiologist for selection of patient who requires receiving critical care services is also necessary.

Keywords: Patient; Admission; Operating room; Intensive care unit; Nursing; Iran

In modern era, ICU was introduced in the 1960s. The results of first public conference on critical care indicated impact of clinical practices on the referral indices for hospitalization in ICU. ICU is one of the important units in each center allocated to the patients in critical conditions [1]. Vital techniques such as airway management, transfusion of blood and various intravenous fluids and drugs, and cardiorespiratory monitoring are the basic health measures in the intensive units.

Along with limited number of beds in ICU, selection and admission of patients should be based on classical indices, especially for patients who benefit of intensive care, have lower risk of mortality and better prognosis. On the other hand, the long stay of patients in ICU isn't cost – effective and is a barrier for admission of new patient. Hence, identification of postoperative complications is necessary for effective planning for optimal use of ICU beds and so, appropriate solutions must be provided to prevent complications. However, the length of stay is associated with patient's preoperative status. The presence of some predictable and unpredictable complications causes the long-term stay of patients in ICU. Risk evaluation is mainstay to decide and to assess about the preoperative risks; hence, some special indices are used. Hence, the precise definition of complication and low threshold seems to be necessary for designing the classification system [2]. Different measures are used to evaluate the risk of operations such as ASA and Goldman classification systems. ASA classification is a status classification system of physical category to examine the patient physical status before choosing the type of anesthesia and operation. Different factors such as age, sex, underlying diseases, clinical symptoms, and laboratory findings are involved in these classifications [2-4].

The constant demand on hospice inpatient services has led to an increasing use of nursing home beds for patients requiring longer-term nursing care, once their symptoms have been controlled and if care at home is not feasible [5].

The study offered some support for the importance of physician-nurse collaboration in ICU care delivery, a variable susceptible to intervention and further study [6].

Methods

The sample size was estimated in regard to the number of operations and patients admitted to ICU in previous years (2015) in Shohada teaching Hospital of Tabriz university of medical sciences and interval of 10 months, 0.5=α, 80% power, and 250 cases. Inclusion criteria were as follow: all the patients who were transferred from OR to ICU were included and their forms were completed. In this form, the factors such as age, sex, underlying diseases, prior reservation for transferring to ICU, unexpected decision for transferring, transferring due to anesthesiologist, surgeon, internal specialists' want, complications in OR, multi-trauma and other causes of transferring were collected. They were

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transferred based on the current conditions to ICU. All information of patient records was kept strictly confidential. The data obtained using the descriptive statistical methods, frequency, percentage by SPSS™ V.17. The values were expressed as Mean ± SE and P- values less than 0.05 were considered significant.

Results

In recent ten months, among 12000 patients undergoing surgical operation, 250 patients were admitted in ICU, and the relevant data was collected. Demographic data was shown in (Table 1).

The mean age of patients undergoing operation who required postoperative intensive care in female patients was higher than the male patients. The type of complication was acute in 151 patients (60.4%), and chronic in 99 patients (39.6%). Four main causes for patient transferring to ICU included the trauma in 109 patients (43.6%), respiratory problems in 51 patients (20.4%), bleeding in 49 patients (19.6%), follow-up and postoperative care in 41 patients (16.4%).

The most common causes in 109 patients with trauma included brain trauma (60 cases), multiple trauma (32 cases), and abdominal trauma (8 cases). The other rare causes were neck trauma (3 cases), femoral fractures and subsequent problems (2 cases), lumbar spine trauma (2 cases), upper extremity trauma (1 case), and lower trauma (1 case). The main causes of stay in ICU were trauma, and the less commonly burn of 159 patients who preoperative transferred to ICU (63.6%), in 64 patients (25.6%) decision for transferring was made in the OR and reservation and confirmation was conducted in OR in 27 patients (10.8%) (Table 2).

The decision to transfer the patients were shown in Table 4. Three main causes of patient admission were the respiratory care in 213 patients (85.2%), level of consciousness control in 46 patients (18.4%) and monitoring and hemodynamic control in 85 patients (34%).

Table1- demographic data of studied population

Variables	Number	Age (Mean ± SD)
Male	144 patients (57.6%)	60.83 ± 1.2 (Min = 1, Max = 88)
Female	106 patients (42.4%)	64.89 ± 1.3 (Min = 24, Max = 88)

Table 2- The reason for transferring the patient to ICU based on ASA classification

ASA Class		I	II	III	IV	V
Trauma, n (%)		26(23.9)	32(29.4)	34(31.2)	13 (11.9)	4 (3.7)
Ventilation, n (%)		6 (11.8)	3 (5.9)	13 (25.5)	15 (29.4)	14 (27.5)
Bleeding, n (%)		10 (20.4)	20 (40.8)	11 (22.4)	4 (8.4)	4 (8.2)
Postoperative care, n (%)		7 (17.1)	10 (24.4)	14 (34.1)	3 (7.3)	7 (17.1)
Preoperative, n (%)		26 (16.4)	36 (22.6)	46 (28.9)	26 (16.4)	25 (15.7)
Preoperative and confirmation in the operating room, n (%)		6 (22.2)	11 (40.7)	7 (25.9)	2 (7.4)	1 (3.7)
Decision-maker	Anesthesiologist, n (%)	20 (13.2)	30 (19.7)	40 (32.2)	26 (17.1)	27 (17.8)
	Surgeon, n (%)	19 (26.8)	25 (35.2)	20 (28.2)	5 (7)	2 (2.8)
	Other experts, n (%)	10 (37)	10 (37)	3 (11.1)	4 (14.8)	0 (0)

Discussion

Present study showed that most common cause for patient transferring to ICU was trauma, especially the brain trauma. In an extensive study in more than 28 hospitals with 37 intensive care units, the patients had higher mortality compared to the patients with medical problems [7]. In one study, the most common cause of patient hospitalization in ICU was the road traffic. The trauma caused the need of patients to hospitalization in ICU [8-9]. Morales et al. conducted a study on 181 trauma patients in the intensive care unit, it was shown that over 84% of causes were road traffic, and in total, 30 patients died [7]. The results of studies have shown that the hospitalization before admission in ICU is an independent and predictive factor in death of patients [10]. Young et al. also showed that the delay in transferring the patient to the intensive care unit in the high-risk patients is associated with increased mortality and costs [11]. Combes et al reported that mortality rate in ICU and the proportion to the standard mortality rate in patients who had been referred from other health centers to ICU is significantly higher. On the other hand, with more pauses before the intensive care units, the mortality rate is higher [12]. The results of Laver et al. on the patients in ICU were similar to the results of this research. Laver also mentioned that the most common cause of death was related to the nervous system and neurosurgical service had referred the most patients to the intensive care unit [13]. The study of Finkielman et al. on the impact of July on the mortality rate and hospitalization length in ICU (October 1994 to September 2002) showed that the most common cause of patient admission was cardiovascular problems, and majority of the patients have been referred to the intensive care unit from the recovery room, and duration of hospitalization as well as the discharge from the hospital in July had no significant difference with other months [14]. Chiavon et al. showed that the mean APACHE score was 16.7± 7.3, and the mean score in the internal patients was 18.5± 7.8 that was almost similar to the group with emergency surgery (18.6± 6.5), while the score in both above-mentioned classes was higher than the group with elective surgery. In this study, the probable mortality rate

was 25.6% and the real mortality rate was 35.5% (internal= 53.6%, emergency surgery= 37.9%, elective surgery= 15.6%) [15].

In this study, the significant difference in results of the cause for transferring, decision time and responsible doctor for patient transferring to ICU based on ASA classification, along with cases with E classification, indicated the fact that in this training hospital, despite the large number of patient admission to the intensive care unit, this might be possible with correct selection of patients who required such services. Thus, the presence and viewpoint of an anesthesiologist in choosing the patients who required the special cares is necessary.

Conclusion

Despite the high number of patient admission to the intensive care unit, this is conducted with correct selection of patients who required such services. The role of doctor is also very critical in this regard. The presence and viewpoint of an anesthesiologist in choosing the patients required to receive the critical care services is also necessary.

The proper planning and consideration of factors in reducing the mortality rate, and correct planning of treatment, the scientific and systematic admission of patients in intensive care units and separation of surgical and internal intensive care units can reduce the mortality rate in this unit as the most important measure for efficiency of the treatment unit.

Ethical consideration:

This study was approved by ethics committee of Tabriz medical Sciences and before ennaument of study assigned informed consent. (number: 5/4/2046)

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