Original Article

Mortality Rate and Risk Factors in Pediatric Intensive Care Unit of Imam Hossein Children's Hospital in Isfahan: A Prospective Cross-Sectional Study

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Abstract

Background: Various studies have conducted to report the mortality rates and its risk factors in pediatric intensive care unit. This study aimed to determine the mortality prevalence and risk factors in PICU of Imam Hossein Children's Hospital in Isfahan, which is the main referral pediatric hospital in the center of Iran.

Materials and Methods: This study was performed on 311 patients during a period of 9 months. The questionnaire which included age, gender, length of stay in the PICU and hospital, mortality, history of resuscitation in other wards and readmission, the causes and sources of hospitalization, pediatric risk of mortality (PRISM)-III score, respiratory supports, morbidities like nosocomial infections, acute kidney injury (AKI), multiple organ dysfunction syndrome (MODS) confirmed by pediatric sequential organ failure assessment score (P-SOFA) and glycemic disorders was filled out.

Results: One hundred and seventy-seven (56.9%) were males and 103 (33%) were belonged to the age group of 12–59 months. The most prevalent causes of hospitalization were status epilepticus (12.9%) and pneumonia (11.2%). Mortality rate was 12.2%. The significant factors associated with mortality were readmission and history of resuscitation. PRISM-III index showed a significant difference between nonsurvivors and survivors (7.05 ± 6.36 vs. 3.36 ± 4.34, $P = 0.001$). Complications like AKI, hypoglycemia, MODS and disseminated intravascular coagulation (DIC), length of mechanical ventilation significantly correlated with mortality.

Conclusions: Mortality rate was less than that of other developing countries (12.2%) and this was associated with some risk factors included readmission, history of resuscitation, PRISM-III Index; complications like AKI, acute respiratory distress syndrome (ARDS), DIC, mechanical ventilation duration, MODS, hypoglycemia, and P-SOFA index.

Keywords: Intensive care units, mortality, pediatric, risk factors

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Introduction

Pediatric intensive care unit is a specialized ward that provides special care to critically/terminally ill children requiring assisted ventilation and hemodynamic monitoring. The main purpose of such a setting is to prevent child mortality by providing constant care which simultaneously imposes extra costs on family and the community.[1] Various studies have reported the mortality rates in Pediatric Intensive Care Unit (PICU) ranging from 2.6% to 37% based on the quality, region, and kind of patients of their settings.[2-7] Numerous researches have examined and evaluated the factors associated with mortality such as age,[8,9] septic shock,[8] and multiple organ

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dysfunction syndrome (MODS)[10,11] length of PICU stay,[12,13] length of mechanical ventilation,[14,15] chronic conditions,[16] and antibiotic-resistant nosocomial infections.[17-19] Because the overall prevalence of mortality in the PICU remains high owing to the vulnerability of the pediatric population and given the resource limitation, it is imperative to predict the mortality risk and its causes. An upgraded version of this tool PRISM-III is widely used in clinical trials as a standard tool to evaluate the prognostic status of patients in PICUs.[10,20,21] In fact, studies in Iran have examined the factors associated with mortality and have reported the mortality prevalence ranging from 6.6% in the northern,[22] 9% in northwestern,[7] and 16.5% in the southwest regions.[23] Factors like age less than 2 years, sepsis and length of hospitalization affected mortality.[22,23] This study aimed to determine the demographic and clinical characteristics and the mortality prevalence of the admitted patients and to assess the risk factors contributing to the increased mortality in PICU of Imam Hossein children's hospital in Isfahan, which is the main referral pediatric hospital in the center of Iran.

Materials and Methods

Study setting

The Imam Hossein pediatric hospital where the data for the study was gathered is the only pediatric specialty center (level 3), under Isfahan University of Medical Sciences consisting about 100 beds and 500 patient admissions annually. Given the high population density of Isfahan province, this hospital provides medical facilities, covering from the central to the Western parts of the country. The PICU setting of this hospital is comprised of 16 beds accommodates candidates of internal medicine and surgery, under the age of 15. The setting provides post-op care for neurosurgical and all other pediatric surgical patients except for pediatric cardio surgery. The setting also accepts patients from every other subspecialty field except liver transplant, renal transplant, and bone marrow transplant. Cancer and hematology patients are admitted only in cases of severe sepsis and other infectious exacerbations while accident and trauma patients will not be hospitalized in this ward. Two pediatric intensivists and at least one senior year pediatric resident alongside an anesthesiologist oversees providing treatment to patients admitted in the PICU setting. The patient to nurse ratio is 2:1 while in situations with critical patients the ratio will be 1:1. The research obtained ethical approval from the ethical research committee of Isfahan University of Medical Sciences.

Study sample and methodology

The present prospective cross-sectional study included all pediatric patients admitted to the PICU of Imam Hossein Pediatric hospital from March 2020 to November 2020. We considered all patients admitted to the PICU at the time of our research as eligible for the study and the sample size was about 311 patients. Patients who were admitted but were discharged from the pediatric intensive care unit with personal consent, patients who underwent brain tumor surgery, shunt implantation, craniotomies and cleft lip and palate surgery and left the PICU in less than 48 hours without complications, and patients who came in for minor surgery such as bronchoscopy and discharged without complications in less than 24 hours were excluded from the study. We administered the PRISM-III questionnaire,[24] and the data were collected via hospital medical records following informed consent from patients' parents. Patient data were recorded for readmission candidates during every hospitalization. The components of the questionnaire involved date of admission, date of discharge, length of stay in the PICU and hospital, death, brain death, history of cardiopulmonary resuscitation, the cause and source of admission, readmission, PRISM score at the time of admission, ventilation support, length of intubation, morbidity as a consequence of PICU stay like nosocomial infections, multiple organ failures confirmed by pediatric sequential organ failure assessment score (P-SOFA) score,[25] glycemic disorders, total parenteral nutrition requirements and pre-existing disease of the child. The questionnaire also addressed demographic variables like age and gender.

Statistical analysis

Data were entered in SPSS 25. software for analysis. Then qualitative data are described by number and percentage, and quantitative data with normal distribution are described by mean (mean ± standard deviation) and with abnormal distribution by median and percentile. Comparison of qualitative data were performed with χ^2 test, quantitative data with normal distribution with independent *t*-test and one-way analysis of variance and quantitative data with abnormal distribution with Mann–Whitney *U*-test. To check the normality of quantitative data, Kolmogorov–Smirnov test is used. P value < 0.05 was considered as statistically significant.

Results

The current study was performed on 311 patients during a period of 9 months in the PICU of Imam Hossein hospital in Isfahan, out of which 177 (56.9%) were males with a mean age of 51.8 ± 53.6 months. Majority of the patients belonged to the age group of 12–59 months (33.1%). The most prevalent cause of hospitalization based on diseases were status epilepticus (12.9%) and pneumonia (11.6%) 0.88 (28.3%) of the patients had no underlying diseases. Also, 21 cases (6.8%) had a history of readmission. The mean PRISM-III score in this population was 3.8 + 4.7. In addition, 254 (81.7%) of the cases were admitted from other wards (25.1%) and emergency department (56.4%) of the study hospital. Forty percent of these patients were transferred to EMD by ambulance. Of the 58 (18.7%) patients referring from outside the hospital, 12.2% were transferred from other hospitals within the city [Table 1].

Among 311 patients, 38 (12.2%) were dead while seven (2.3%) died from brain death. The length of PICU stay was 10.8 ± 11 days. During the stay, 19% and 11% of cases acquired nosocomial infection and acute kidney injury (AKI), respectively and 54.9% suffered from multiorgan dysfunction.

Table 1: Characteristics of study population

Age groups	*N* (%)
Infant (1-11 months) (*n* [%])	96 (30.9%)
Child (12-59 months) (*n* [%])	103 (33.1%)
Adolescent (60-144 months) (*n* [%])	88 (28.3%)
Youth (>144 months) (*n* [%])	24 (7.7%)
PRISM-III score (mean±SD)	3.8±4.7
Cause of PICU admission (*n* [%])	
Pneumonia	36 (11.6%)
Acute respiratory distress syndrome	3 (1%)
Post operation	78 (25.1%)
Sepsis/septic shock	23 (7.4%)
Statues seizure	40 (12.9%)
Heart failure	13 (4.2%)
Liver failure/hepatic encephalopathy	8 (2.6%)
Encephalitis/meningitis	19 (6.1%)
Sever GI bleeding	4 (1.3%)
Acute weakness (GBS/TM)	10 (3.2%)
Acute and chronic renal failure	3 (1%)
Metabolic crisis	2 (0.6%)
Hypertension crisis	2 (0.6%)
Upper airway obstruction	6 (1.9%)
Diabetic ketoacidosis	6 (1.9%)
Poisoning	5 (1.6%)
Severe anemia and coagulopathy	5 (1.6%)
Asthma/bronchiolitis	20 (6.4%)
Others	28 (9%)
Internal hospital admission	253 (81.7%)
Ward	78 (25.1%)
EMR/parents	51 (16.4%)
EMR/ambulance	124 (40%)
Interhospital admission	58 (18.7%)
This city	38 (12.2%)
Other cities	20 (6.4%)
Readmission (*n* [%])	21 (6.8%)
History of resuscitation (*n* [%])	21 (6.8%)
Ward/emergency	13 (4.2%)
PICU	8 (2.6%)
CV line insertion	70 (22.5%)
Underlaying disease	223 (71.7%)
Metabolic disease	18 (5.8%)
Epilepsy	34 (10.9%)
Cerebral palsy	13 (4.2%)
Congenital heart disease	13 (4.2%)
Syndromic disease	6 (1.9%)
Congenital anomaly	12 (3.9%)
GI disease	15 (4.8%)
Renal disease/ESRD	10 (3.2%)
Neuromuscular disease	2 (0.6%)
Malignancy/tumor	17 (5.5%)
Blood disease	5 (1.6%)
Hydrocephalus	6 (1.9%)
None	88 (28.3%)
Other	72 (23.2%)

Patients requiring mechanical ventilation was 34% and length of intubation ranged at 3 ± 7.1 days [Table 2].

Tables 3 and 4 describe the factors associated with mortality. With regards to clinical and demographic features, history of readmissions and resuscitation was significantly associated with mortality ($P = 0.001$). The PRISM-III index showed a significant difference between nonsurvivors and survivors ($P = 0.001$) (7.05 ± 6.36 vs. 3.36 ± 4.34). No significant difference was observed in the mortality rates with internal hospital and interhospital admissions ($P = 0.24$).

Throughout the PICU stay, complications like AKI ($P = 0.001$), ARDS ($P = 0.001$), hypoglycemia (0.001), and disseminated intravascular coagulation (DIC) ($P = 0.001$) significantly correlated with mortality. Moreover, the difference in duration of mechanical intubation in survivors and nonsurvivors was statistically significant (2.28 ± 5.8 vs. 8.7 ± 11.8) ($P = 0.001$).

The P-SOFA index in the dead patient group was significantly higher than the recovery group (9.4 ± 3.7 vs. 3.6 ± 3.04) ($P = 0.001$). Involvement of cardiovascular, respiratory, renal, coagulation, and neurologic systems except for hepatic system confirmed by P-SOFA criteria was significantly associated with mortality. There was not significant association between length of stay in hospital and PICU with mortality rate [Table 4].

Discussion

This report is the first study to evaluate the PICU setting located in Isfahan, which is the main referral pediatric hospital in the center of Iran. The mortality rate of 12.2% in this setting was higher in comparison with north (6.6%),[22] northwest (9%)[7] regions of Iran whereas it was lower compared to the southern parts (16.5%).[23] Yet our result, in comparison with countries like India (24%),[4] Brazil (15%),[21] Pakistan (14%),[26] South Africa (15.6%),[3] Egypt (33%), and[6] Saudi Arabia (37.4%)[5] revealed a low prevalence rate. This contrasts with developed countries like China (2.9%), Netherland (6.6%), United States (4.8%), and Australia (4.25%) demonstrating a low rate of mortality.[7]

In actual, mortality depends on the case-mix, expertise of the personnel, hygiene of the environment, facilities and equipment, infrastructure, and the economic policies of the country.[8] Like many reports,[3,7,10] no correlation was observed between the age groups and gender with mortality, but some studies reported a correlation between mortality and the age below 1 year.[8,9]

Meanwhile, the length of PICU stay was 10.8 ± 11 and about half of the patients stayed more than 7 days in the PICU and hospital setting (69.5% and 44.7%). In disparity with study conducted in Tabriz,[7] our findings showed high rate of length of stay in hospital and PICU. Some studies mentioned an association between mortality and the length of PICU stay and mentioned that patients who died used more resources in terms of bed days and diagnostic tests than survivors.[12,13,21] In this study, there was no significant relationship between LOS and mortality as was documented in India[27] and Egypt.[28]

Table 2: Outcomes and complications during PICU hospitalization among studied population

Variables	*n*=311
Outcomes	
Mortality (*n* [%])	38 (12.2%)
Brain death (*n* [%])	7 (2.3%)
Length of hospital stay (mean±SD), day	15.4±13.4
Length of PICU stay (mean±SD), day	10.8±11
Hospital stay >7 days (*n* [%])	216 (69.5%)
PICU stay >7 days (*n* [%])	139 (44.7%)
Complications	
Acute kidney injury (*n* [%])	34 (11%)
Conservative (*n* [%])	23 (7.4%)
Peritoneal dialysis (*n* [%])	5 (1.6%)
Hemodialysis (*n* [%])	6 (2%)
Acute respiratory distress syndrome (*n* [%])	11 (3.5%)
Dissemination intravascular coagulopathy (*n* [%])	14 (4.5%)
Respiratory supports (*n* [%])	199 (64%)
Oxygen therapy (*n* [%])	96 (30.9%)
Noninvasive ventilation (*n* [%])	89 (28.6)
Mechanical Ventilation (*n* [%])	106 (34%)
Tracheostomy (*n* [%])	3 (1%)
Duration of mechanical ventilation (mean±SD), day	3±7.1
Nosocomial Infection (*n* [%])	59 (19%)
Sepsis (*n* [%])	20 (6.4%)
Aspiration Pneumonia (*n* [%])	10 (3.2%)
Ventilator Associated Pneumonia (*n* [%])	19 (6.1%)
Urinary Tract Infection (*n* [%])	45 (14.5%)
Catheter relative blood stream infection (*n* [%])	18 (5.8%)
Bacterial (*n* [%])	28 (9%)
Fungal (*n* [%])	13 (4.2%)
TPN (*n* [%])	49 (15.8%)
Hyperglycemia (*n* [%])	33 (10.6%)
Hypoglycemia (*n* [%])	5 (1.6%)
Multiorgan dysfunction (MOD) (*n* [%])	171 (54.9%)
Cardiovascular (*n* [%])	51 (16.4%)
Respiratory (*n* [%])	216 (69.5%)
Coagulation (*n* [%])	66 (21.2%)
Neurologic (*n* [%])	88 (28.2%)
Hepatic (*n* [%])	38 (12.2%)
Renal (*n* [%])	142 (45.8%)
P-SOFA score (mean±SD)	4.3±3.6
Number of organ dysfunction	
One (*n* [%])	95 (30.9%)
Two (*n* [%])	87 (28%)
Three (*n* [%])	45 (14.5%)
Four (*n* [%])	28 (9%)
Five (*n* [%])	10 (3.2%)
Six (*n* [%])	1 (0.3%)

The PRISM-III index in our study was 3.8 ± 4.7. Similar to all studies so far was significantly higher in the dead patient group compared to the recovery group indicating its validity in predicting mortality rates in PICU in advance.[7,10,20,21]

As demonstrated by the majority of the studies,[9,10] the common cause of PICU admission were status epilepticus (12.9%) and pneumonia (11.6%) although no significant correlation with mortality was observed. This contrasts with study findings in Egypt which stated a significant correlation between mortality and congenital heart diseases and sepsis.[8] Studies from America reported a significant correlation of mortality to infections and oncologic causes.[9]

Further, readmission to PICU and history of resuscitation directly correlated with mortality. However, the intensive care facilities are limited and expensive, especially in developing countries. This limitation of resources and cost constraints lead to early discharge of patients from intensive care units. Unexpected readmission of these patients is associated with bad outcome and mortality.[29-31]

During PICU hospitalization, 11% were affected by AKI and 3.6% of those required dialysis. About 64% required respiratory support and 34% underwent mechanical ventilation for a mean duration of 3 days. More than half patients (54.9%) had multi-organ dysfunction syndrome. A significant difference was noticed between survivors and nonsurvivors in terms of ARDS, DIC, AKI, length of mechanical ventilation, MODS, P-SOFA index, and hypoglycemia.

In the study conducted in Ahvaz also noted a high rate of mortality in intubated patients.[23] In another study from Pakistan[14] reported a significant association between mortality rate and the increased duration of mechanical ventilation with a sample of 50.7% under mechanical ventilation for 2.1 days on average.

The study conducted in India showed with 49.5% of no survivors had MODS and the primary cause of death was due to hospitalization.[32] In another report, MODS was risk factor for death.[21]

On the other hand, in a study based in Canada mentioned that acquiring AKI in PICU increased the length of hospitalization and the chances of mortality.[33] Similarly, a study from Spain stated that the length of mechanical ventilation and the need for dialysis during hospitalization raised the chance of mortality.[13]

Similar to our results, findings of the study in United States showed hypoglycemia occurred in 2.2% of patients and hypoglycemia correlated with an increased mortality rate.[34]

In the present study, around 19% of the patients acquired nosocomial infections, 14% out of which accounted for UTI while 6% accounted for VAP and sepsis but significant association between mortality and nosocomial infection was not observed. The nosocomial infection rates in PICU range from 3% to 27%. Higher incidences are found in units where patients have a more severe underlying disease or undergo either nonelective or high-risk surgeries.[35] likewise, the study in Peru with 19.5% nosocomial infection mostly consisted of VAP and UTI but reported nosocomial infections increased hospital stay and the mortality rate in PICU.[36]

Table 3: Associations of survivors and nonsurvivors with characteristics of study population

	Survivors (*n*=273)	Nonsurvivors (*n*=38)	*P*
Gender			
Male (*n* [%])	153 (56%)	24 (63.2%)	0.25
Female (*n* [%])	120 (44%)	14 (36.8%)	
Age (mean±SD) (months)	51.79±52.6	52±61.3	0.77
Age groups			0.2
Infant (1-11 months) (*n* [%])	85 (31.3%)	11 (28.9%)	
Child (12-59 months) (*n* [%])	86 (31.5%)	17 (44.7%)	
Adolescent (60-144 months) (*n* [%])	82 (26.3%)	6 (15.7%)	
Youth (>144 months) (*n* [%])	20 (7.3%)	4 (10.5%)	
PRISM-III score (mean±SD)	3.36±4.34	7.05±6.36	0.001
Cause of PICU admission (*n* [%])			0.2
Pneumonia	31 (11.4%)	5 (13.2%)	
Acute respiratory distress syndrome	1 (0.4%)	2 (5.3%)	
Post operation	75 (27.5%)	3 (7.9%)	
Sepsis/septic shock	16 (5.9%)	7 (18.4%)	
Statues seizure	37 (13.6%)	3 (7.9%)	
Heart failure	11 (4%)	2 (5.3%)	
Liver failure/liver Encephalopathy	8 (2.9%)	0 (0%)	
Encephalitis/meningitis	17 (6.2%)	2 (5.3%)	
Sever GI bleeding	4 (1.5%)	0 (0%)	
Acute weakness (GBS/TM)	8 (2.9%)	2 (5.3%)	
Acute and chronic renal failure	3 (1.1%)	0 (0%)	
Metabolic crisis	0 (0%)	2 (5.3%)	
Hypertension crisis	2 (0.7%)	0 (0%)	
Upper airway obstruction	6 (2.1%)	0 (0%)	
Diabetic ketoacidosis	6 (2.1%)	0 (0%)	
Poisoning	5 (1.8%)	0 (0%)	
Severe anemia and coagulopathy	5 (1.8%)	0 (0%)	
Asthma/bronchiolitis	18 (6.5%)	4 (10%)	
Others	18 (6.5%)	8 (21%)	
Internal hospital admission	224 (82%)	29 (76.3%)	0.86
Ward	68 (24.9%)	10 (26.3%)	
EMR/parents	46 (16.8%)	5 (13.1%)	
EMR/ambulance	110 (40.2%)	14 (36.8%)	
Interhospital admission	48 (17.5%)	9 (23%)	0.5
This city	31 (11.3%)	7 (18.4%)	
Other cities	17 (6.2%)	2 (5.2%)	
Readmission (*n* [%])	14 (5.1%)	7 (18.4%)	0.001
History of resuscitation (*n* [%])	9 (3.3%)	12 (31.6%)	0.001
PICU	3 (1.1%)	5 (13.2%)	
Ward/Emergency	6 (2.2%)	7 (18.4%)	
Underlaying disease (*n* [%])	197 (72.1%)	26 (68.4%)	0.19
Metabolic disease	13 (4.8%)	5 (13.2%)	
Epilepsy	31 (11.4%)	3 (7.9%)	
Cerebral palsy	12 (4.4%)	1 (2.6%)	
Congenital heart disease	12 (4.4%)	1 (2.6%)	
Syndromic disease	5 (1.8%)	1 (2.6%)	
Congenital anomaly	12 (4.4%)	0 (0%)	
GI disease	14 (5.1%)	1 (2.6%)	
Renal disease/ESRD	8 (2.9%)	2 (5.3%)	
Neuromuscular disease	2 (0.7%)	0 (0%)	
Malignancy/tumor	12 (4.4%)	5 (13.2%)	
Blood disease	4 (1.5%)	1 (2.6%)	
Hydrocephalus	6 (2.2%)	0 (0%)	
Other	66 (24.1%)	6 (15.7%)	

Table 4: Associations of survivors and nonsurvivors with factors during hospitalization

	Survivors (*n*=273)	Nonsurvivors (*n*=38)	*P*
Acute kidney injury (*n* [%])	22 (8.1%)	12 (31.5%)	0.001
Conservative (*n* [%])	15 (5.5%)	8 (21.1%)	
Peritoneal dialysis (*n* [%])	3 (1.1%)	2 (5.3%)	
Hemodialysis (*n* [%])	4 (1.5%)	2 (5.3%)	
Acute respiratory distress syndrome (*n* [%])	4 (1.5%)	7 (18.4%)	0.001
Dissemination intravascular coagulopathy (*n* [%])	4 (1.5%)	10 (26.3%)	0.001
Respiratory supports (*n* [%])	162 (59.3%)	37 (97.3%)	0.001
Duration of mechanical ventilation (mean±SD), day	2.28±5.8	8.7±11.8	0.001
Nosocomial infection (*n* [%])	49 (17.9%)	10 (26.3%)	0.2
Sepsis (*n* [%])	15	5	
Aspiration pneumonia (*n* [%])	9	1	
Ventilator associated pneumonia (*n* [%])	17	2	
Urinary tract infection (*n* [%])	36	9	
Catheter relative blood stream infection (*n* [%])	14	3	
TPN (*n* [%])	39 (14.3%)	10 (26.3%)	0.05
Hyperglycemia (*n* [%])	27 (9.9%)	6 (15.8%)	0.2
Hypoglycemia (*n* [%])	1 (0.4%)	4 (10.4%)	0.001
Multiorgan dysfunction (MOD) (*n* [%])	230 (84%)	37 (97%)	0.001
Cardiovascular (*n* [%])	31 (11.3%)	19 (50%)	0.001
Respiratory (*n* [%])	178 (65.2%)	37 (97%)	0.001
Coagulation (*n* [%])	47 (17.2%)	18 (47%)	0.001
Neurologic (*n* [%])	67 (24.5%)	20 (52%)	0.001
Hepatic (*n* [%])	32 (11.7%)	5 (13%)	0.48
Renal (*n* [%])	115 (42.1%)	26 (68%)	0.002
P-SOFA score (mean±SD)	3.6±3.04	9.4±3.7	0.001
Number of organ dysfunction (*n* [%])			
Two (*n* [%])	78 (28.7%)	9 (23.7%)	
Three (*n* [%])	35 (12.9%)	10 (26.3%)	
Four (*n* [%])	17 (6.2%)	11 (28.9%)	
Five (*n* [%])	5 (1.8%)	5 (13.2%)	
Six (*n* [%])	1 (0.4%)	0 (0%)	
Length of PICU stay (mean±SD), day	10.54±10.49	12.6±14.5	0.27
Length of hospital stay (mean±SD), day	15.3±12.93	15.9±16.78	0.3

As described in some reports,[3] resource admission included internal and interhospital admission of patients was not related to mortality. But in another report, the mortality was doubled in patients admitted from wards when compared with the emergency room patients.[37]

The limitations faced by the current study includes small sample population with short duration of study. Hence, we suggest future studies to include a larger sample and examine additional factors associated with mortality rates.

Conclusion

Overall, the mortality rate observed in this center was less than that of other developed countries (12.2%) and this was associated with some risk factors included readmission, history of resuscitation, PRISM-III Index; complications like AKI, ARDS, DIC, mechanical ventilation duration, MODS, hypoglycemia, and P-SOFA index. Mortality rate could be further reduced by improving expertise of nurses and personnel, facilities, and infrastructure and by increasing the hygiene of the surroundings.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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