

Original Article

Characteristics of Critically ill Obstetric Patients Admitted to the ICU at a Tertiary Care Centre

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Abstract

Objective: To ascertain the characteristics, admission indications, interventions, and outcomes of obstetric patients admitted to ICU.

Methodology: A retrospective, descriptive study was conducted at Lady Reading Hospital's ICU in Peshawar, Pakistan (January 1 to December 31, 2022). During this time, a total of 1560 patients were received in the ICU, out of which 132 full filled our inclusion and exclusion criteria. Characteristics of patients, reasons for admission, interventions, demographic information, obstetric history, length of stay, and outcomes were collected through a retrospective review of medical records. Statistical analysis was performed using SPSS software version 21.0.

Results: Among the 1,560 admissions in ICU, 132 were obstetric cases (8.5% of all ICU admissions). Majority of these patients had a mean age of 27.05 ± 6.23 years, with mean ICU stay duration of 6.55 ± 7.05 days. Among these, hypertensive disorders of pregnancy were identified in 47 patients (35.6%). Obstetric hemorrhagic disorders accounted for admission in 40 patients (30.3%). Out of the 132 patients, 26 (19.6%) did not survive. Highest mortality rates were of those admitted with fulminant hepatic failure (2 patients, 66.7%). Among patients admitted for direct obstetric reasons, post-natal septicemia caused the highest mortality (3 patients, 37.5%). Ventilatory support was required by 113 patients (85.6%) and vasopressor support was administered to 87 patients (65.9%) of the patients.

Conclusions: To decrease maternal mortality and improve healthcare for pregnant individuals, it is crucial to focus on hypertensive disorders of pregnancy and obstetric hemorrhage. Addressing these issues, along with providing effective post-natal sepsis treatment, can contribute to a reduction in mortality rates.

Keywords: Obstetric hemorrhage, Pre-Eclampsia, Post-natal septicemia, Mortality

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Introduction

The presence of obstetric patients in the Intensive Care Unit (ICU) poses a distinctive and intricate challenge. Being admitted to an ICU can be seen as a measurable indication of maternal morbidity.^{1,2} Fortunately, critically ill pregnant women requiring ICU admission during childbirth represents a very small proportion of ICU admissions.³

The convergence of pregnancy and critical illness

necessitates specialized care that addresses the unique needs of both the mother and the fetus. Managing these patients requires a multidisciplinary approach, involving obstetricians, intensivists, and anesthesiologists.

In developing countries like Pakistan, obstetric patients constitute a significant proportion of ICU admissions. However, there is a scarcity of published studies from this region that explore the incidence, progression, and outcomes of obstetric patients requiring intensive care. Remarkably, there is a lack of data specifically from the city of Peshawar.

The primary aim of our study was to assess the characteristics and outcomes of obstetric admissions in our ICU, situated within a tertiary care hospital of Peshawar. By conducting this research, we aim to address the existing knowledge gap and provide valuable insights into the characteristics and prognosis of obstetric patients in this setting.

Methodology

This research was conducted at Lady Reading Hospital (LRH) in Peshawar following approval from the Institutional Review Board (Ref no. 906/ LRH/ MTI). LRH is a government sector hospital with a capacity of 1700 beds, including a 33-bedded general intensive care unit (ICU).

A retrospective study was undertaken, focusing on obstetric patients admitted to the ICU from January 1st to December 31st, 2022. The study included all pregnant patients and women within 6 weeks post-partum. Patients who passed away within 24 hours of ICU admission were excluded from the study. A total of 132 patients full filled our inclusion and exclusion criteria.

The necessary medical records were retrieved during March 2023 to May 2023, from the electronic health record system, and data was recorded using a pre-designed proforma. Statistical analysis was carried

out using SPSS version 21.0. The frequencies and percentages were given for qualitative variables, while the Mean±SD was for the quantitative variables. The Shapiro Wilk test was applied in SPSS to check for normality of quantitative variables i-e maternal age, gravidity, parity and gestational age. The results revealed that all these variables were not normally distributed.

Results

During the period of study, a total of 1,560 admissions were documented in the Intensive Care Unit. Among these admissions, there were 132 obstetric cases, accounting for 8.5% of the overall ICU patient population. Most of the patients were admitted in the post-partum period. Characteristics of the study participants are presented in Table I.

Hypertensive disorders of pregnancy (47 cases, 35.6%) and obstetric hemorrhage (40 cases, 30.3%) were the leading indications for admission. Within the hypertensive disorders of pregnancy category, severe preeclampsia was observed in a single patient (0.8%), while eclampsia was present in 46 patients (34.8%). Among obstetric hemorrhage, Post-Partum Hemorrhage accounted for the highest number of cases (17 cases, 12.9%). Other indications for hemorrhage included uterine rupture (10 cases, 7.6%), abruptio placentae (10 cases, 7.6%), and abnormal placentation (3 cases, 2.3%). Three patients (2.3%) were diagnosed with HELLP syndrome, characterized by hemolysis, elevated liver enzymes, and low platelet count.

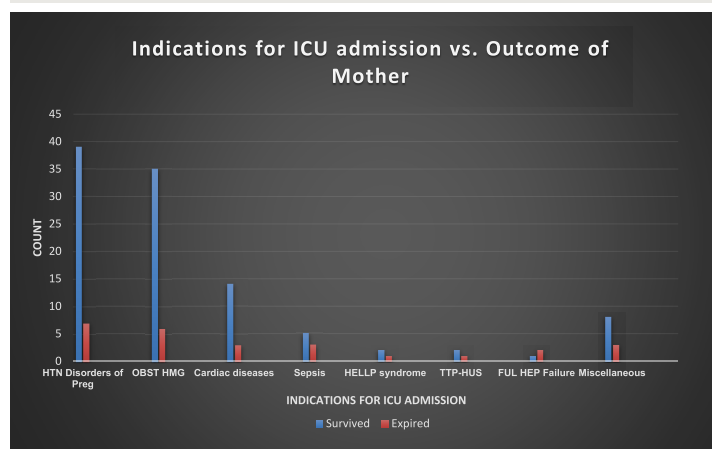
Among the patients, 17 (12.9%) had cardiac disease, which consisted of 15 cases (11.4%) of Peri-partum dilated cardiomyopathy, one case (0.8%) of mitral valve stenosis, and one case (0.8%) of mixed mitral valve disease. There were eight cases (6.1%) of post-natal septicemia, three cases (2.3%) of TTP-HUSS, and three cases (2.3%) of fulminant hepatic failure. Additionally, 11 cases (8.3%) were admitted for various

miscellaneous reasons, including post-operative care for high-risk pregnancies, post-operative cardiac arrest during emergency C-section, pulmonary embolism, ARDS, status epilepticus, and acute gastroenteritis.

Among the 132 patients admitted, 26 patients (19.6%) passed away, indicating the mortality rate. Overall, highest mortality rates were observed in patients admitted with fulminant hepatic failure (2 patients, 66.7%), although for direct obstetric indications, highest mortality was noted in post-natal septicemia (3 patients, 37.5%)

Table 1: Characteristics of obstetric patients in ICU
Data presented as mean ± standard deviation

Characteristics	Result
Maternal age (years)	27.05 ± 6.23
Gravidity	3.86 ± 2.91
Parity	3.02 ± 2.69
Gestational age (weeks)	36.42 ± 3.87



Acronym:	Stands for:
HTN Disorders of Preg	Hypertensive Disorders of Pregnancy
OBST HMG	Obstetric Hemorrhage
HELLP Syndrome	Hemolysis, Elevated Liver enzymes, and Low Platelets
TTP-HUS	Thrombotic Thrombocytopenic Purpura and Hemolytic Uremic Syndrome
FUL HEP Failure	Fulminant Hepatic Failure

Figure 1: Indications for ICU admission vs outcomes of mother

Various interventions were required for patients in the ICU (Table 2).

Table 2: Interventions required in ICU

Interventions	Number
Mechanical Ventilation	113(85.6%)
Vasopressor Support	87(65.9%)
Renal Replacement Therapy	28(21.2%)
Blood products Transfusion	74(56.1%)
Plasmapheresis	04(3%)

Discussion

The total count of obstetric admissions in a critical care unit serves as a crucial indicator for assessing the occurrence of life-threatening complications in pregnant mothers. Our research revealed that 8.5% of all ICU admissions were obstetric patients, a finding which is consistent with national studies,⁴ but contrary to international studies which have a lower number of obstetric patients being admitted to the ICU.^{5,6} This variation could arise from the possibility that international studies and foreign medical facilities employ more rigorous criteria for admitting patients to the ICU compared to the standards applied in our own ICU. Moreover, we observed that the majority of these patients belonged to a younger age group, with a mean age of 27.05 years, which aligned with other studies.^{7,8,9}

The average length of stay in ICU in our study was 6.5 days. However, international studies reported shorter duration of stay.⁷ This disparity in ICU stay duration may reflect differences in healthcare systems and resources of developed and developing nations. The most common indications for ICU admissions (Figure 1) were Hypertensive disorders of Pregnancy and Obstetric hemorrhages, in line with several other studies.¹⁰

The mortality rate observed was 19.6%. Mortality rates exhibit variability depending on the development status of the country. In the case of Pakistan, a developing nation, reported data indicates markedly higher mortality rates.¹¹ This finding highlights the need for improved healthcare infrastructure, resour-

ces, and access to quality obstetric care in developing regions to reduce maternal mortality and improve outcomes for obstetric patients.

Among direct obstetric conditions, post-natal septicemia had the highest mortality rate (Figure I), consistent with previous research.¹² This is because in rural areas of Pakistan, women have poor access to safe maternal healthcare services compared to those in urban areas. Reports suggest that 59 % of rural women do not receive proper prenatal care. Additionally, 86 % of them give birth at home with the assistance of untrained birth attendants.¹³ These untrained attendants lack knowledge of clean and safe delivery practices and are ill-equipped to handle pregnancy complications. Mechanical ventilation was found to be the most common intervention performed in the ICU, a finding that mirrored other studies.¹⁴

Our study had certain limitations, including retrospective study design and small sample size.

Conclusions

For reducing maternal mortality and enhancing healthcare for this specific patient group, the hypertensive disorders of pregnancy and obstetric hemorrhage need special attention. Effective treatment of post-natal sepsis may reduce mortality in these patients. Maintenance and regular cleaning of ventilators in intensive care units should be well taken care of to deal with such critically ill patients.

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Authors Contribution

UK: Conceptualization of study

UK: Literature Search

UK: Statistical Analysis

MLS: Data Collection and Analysis

MLS: Writing of Manuscript

MTK: Drafting, Revision

All authors are equally accountable for accuracy, integrity of all aspects of the research work.