

Characteristics and Outcomes of Antepartum Pregnant Women In The Intensive Care Unit: A Retrospective Study

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ABSTRACT

This study aims to retrospectively evaluate obstetric cases admitted to the intensive care unit (ICU) due to complications during the antepartum period.

A retrospective review was conducted on 114 obstetric cases admitted to the Intensive Care Unit of Diyarbakır Gazi Yaşargil Training and Research Hospital for Gynecology and Obstetrics during the antepartum period between 2015 and 2017. The cases were evaluated for age, comorbidities, reason for admission, gestational age, and length of stay in the intensive care unit.

The mean age of the patients was 29.61 ± 6.71 , and the mean gestational age was 26.69 ± 5.69 . The average length of stay in the ICU was 1.56 ± 0.57 days. The most common reason for ICU admission was preeclampsia, with 26.31% (n=30) of patients admitted due to this condition. Abortus imminence was the second most common reason for admission (n=7, 10.3%). 81.57% of the patients had no comorbidities, and the most frequently observed comorbidity was anemia, at 8.77%. We found that the most common reasons for admission to the ICU during the antepartum period were preeclampsia, eclampsia, oligohydramnios, and anhydramnios, and that the most common comorbidity was anemia.

Keywords: Pregnancy, intensive care unit, preeclampsia

Introduction

During pregnancy, physiological changes occur in all of the mother's organ systems, triggered by hormones secreted from the placenta and corpus luteum. In addition to these physiological changes, some serious conditions that threaten the life of the mother and lead to morbidity and mortality may also develop. Among these conditions are peripartum hemorrhage, hypertensive disorders of pregnancy, hemolysis, HELLP syndrome (Hemolysis, Elevated Liver enzymes, Low Platelet), acute fatty liver of pregnancy, gestational diabetes mellitus, embolism, infectious issues, and exacerbation of pre-existing conditions.¹⁻³

Although the pregnant patient group is young, severe clinical conditions that require intensive care monitoring may develop in this group. Early admission of pregnant patients to the intensive care unit (ICU) and close monitoring may help in

early recognition of problems that may arise during pregnancy and minimize morbidity and mortality. In the literature, the need for intensive care in pregnant women ranges from 0.1% to 0.9%, and the mortality rate varies widely, from 0% to 36%.²⁻⁴

In this study, we primarily aimed to investigate the reasons for ICU admissions of pregnant women admitted to the second-level ICU of our hospital. Secondly, we aimed to retrospectively examine the demographic characteristics, comorbidities, and ICU length of stay of these patients.

Materials and Methods

This retrospective cohort study was conducted in the Gynecology and Obstetrics Annex building of the Health Sciences University Gazi Yaşargil Training and Research Hospital between January

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2015 and January 2017. The necessary permission for the study was obtained from the Ethics Committee of the Health Sciences University, Diyarbakır Gazi Yaşargil Training and Research Hospital (17/07/2017, No: 68). All patients were informed in detail about the treatment at the second-level intensive care unit, and their informed consent was obtained. This study was designed to be conducted in accordance with the 2013 Helsinki Declaration.

Between 2015 and 2017, a total of 4,740 patients were admitted to the second-level adult intensive care unit in the Women's Health and Obstetrics Hospital, of which 126 were pregnant women (2.65%). The study was conducted through the retrospective examination of the file records of all 126 pregnant patients. Data for 12 pregnant patients during this period were incomplete, and therefore, they were excluded from the study. The data recorded for the 114 patients included their age, gestational age, presence of comorbidities, reasons for ICU admission, and the length of stay in the intensive care unit.

Statistical Analysis: All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables (e.g., maternal age, gestational age, ICU length of stay) were assessed for normality using the Shapiro–Wilk test. Normally distributed variables were presented as mean $\pm$ standard deviation (SD), and non-normally distributed variables as median and interquartile range (IQR). Categorical variables (e.g., presence of comorbidities, reasons for ICU admission) were summarized as frequencies (n) and percentages (%). As the study was descriptive, no hypothesis testing was performed, and no p-values were calculated. Missing data were excluded from the relevant analyses using pairwise deletion. Descriptive statistics covered the entire study population, and results are presented in tables for clarity.

Results

Between 2015 and 2017, a total of 126 pregnant patients were admitted to the second-level adult intensive care unit in the Women's Health and Obstetrics Hospital, of which 12 patients' data were inaccessible. Complete data for 114 patients were obtained. Among these 114 patients, 3 were transferred to a higher center (third-level ICU) with a diagnosis of eclampsia. The transfer rate to external centers was found to be 2.63%.

The mean age of the patients was 29.61 ± 6.71 years. The youngest pregnant patient was 15 years

old, and the oldest was 44. The mean gestational age of the patients was 26.69 ± 5.69 weeks. In terms of length of stay in the ICU, the average length of stay was 1.56 ± 0.57 days. The patient who stayed the longest in the ICU (excluding the 3 patients transferred to the third-level ICU) stayed for 4 days (Table 1).

18.43% (n=21) of the pregnant women had comorbidities. The most commonly observed comorbidity in pregnant women was anemia, which was found in 8.77% (n=10) of the cases (Table 2).

When examining the reasons for ICU admission of pregnant patients, preeclampsia and eclampsia were found to be the most common causes, with 26.31% (n=30) of the cases. Oligohydramnios-anhydramnios was the second most common reason, found in 21.92% (n=28) of the cases (Table 3).

Discussion

The pregnancy period is generally a natural process that progresses with physiological changes in the mother, without complications.⁵ However, in some pregnancies, the patient's pre-existing conditions may flare up, or various pregnancy-related complications may arise. Life-threatening events and the need for intensive care may occur during pregnancy or the postpartum period. In our study, which aimed to investigate the reasons for ICU admissions of pregnant women in the second-level ICU of our hospital, we found that the most common reason for ICU admission was preeclampsia, with 26.31% (n=30) of the cases. When reviewing the literature, similarly, Keleş et al. reported that the most common reasons for ICU admission were preeclampsia/eclampsia (38.7%).⁶ Demirkiran and colleagues, in their 5-year retrospective study, reported that the most common reason for ICU admission was preeclampsia/eclampsia (73.6%).⁵ Pollock et al., in their study evaluating antepartum and postpartum patients, found that the most common reason for ICU admission was hypertensive disorders of pregnancy.⁷ Chantray et al., in their study that included both antepartum and postpartum patients, reported obstetric hemorrhage as the most common reason for ICU admission, with hypertensive disorders of pregnancy being the second most common.⁸⁻⁹

Secondarily, we also retrospectively analyzed the patients' demographic characteristics, comorbidities, and ICU length of stay. In our study, the average length of stay in the ICU was

Table 1: Demographic Data of Pregnant Women Admitted To The Intensive Care Unit

Parameters	Mean $\pm$ SD*
Maternal Age(Years)	29,61 $\pm$ 6,71
Gestational Age(Months)	26,69 $\pm$ 5,69
Number of Days Stayed in ICU (Days)	1,56 $\pm$ 0,57

*SD: Standard deviation

Table 2: Comorbidities of Pregnant Patients In The Intensive Care Unit

Parameters	n	%
None	93	81,57
Anemia	10	8,77
Asthma	1	0,87
DM*	3	2,63
DM + HT**	1	0,87
Epilepsy	2	1,75
Asthma +HT	1	0,87
Cardiac Disease	3	2,63
Total	114	100

*Diabetes Mellitus **Hypertension

Table 3: Reasons For Pregnant Women's Stay In Intensive Care

Parameters	n	%
Preeclampsia/Eclampsia	30	26,31
Obstetric Hemorrhage	24	21,05
Cardiac Pathology	4	3,5
Epilepsy	2	1,75
Endocrinopathies	1	0,87
Respiratory Pathologies	1	0,87
Sepsis	1	0,87
Anemia	7	6,14
Oligohydramnios-anhydramnios	28	24,56
Others	16	14,03

1.56 $\pm$ 0.57 (1-4) days.⁹ Leung et al. reported an average ICU stay of 2 days, with hospital stay lengths extending up to 10 days.¹⁰ Loverro et al. found an ICU stay of 5.1 $\pm$ 3.4 days. Chantry et al. reported an average ICU stay of 3 $\pm$ 0.1 days.¹³

During the study period, 2.65% (126/4740) of the pregnant patients were admitted to our ICU. In the literature, studies evaluating obstetric patient rates often combine antepartum and postpartum periods, rather than focusing solely on the percentage of pregnant women admitted to the ICU. Pollock et al., in their systematic review, reported the ICU admission frequency for

pregnant and postpartum patients as 0.4–16.0%. Leung et al., in their study of antepartum and postpartum obstetric patients, found the ICU admission rate to be 0.65% (50/7692).¹⁰ Chantry et al., in their study evaluating antepartum and postpartum patients over a 3-year period in France, reported an ICU admission rate of 3.6 per 1,000 births for pregnancy-related ICU admissions. The ICU admission rate in our study is similar to that in other studies in the literature. The data in the literature typically concern third-level ICUs, which cover all patient groups.¹¹⁻¹²

There are various limitations in our study. The first limitation is the inability to include patients who required ICU care but were not admitted due to a lack of available beds, and were followed up in clinical conditions. Since this is a retrospective study, and no data was available in the records, these patients were excluded. The second limitation is that the study is single-center. A larger patient group should be examined in future studies. Since our study was conducted in a single center and with a small patient population, our results are not generalizable.

In conclusion, early admission and management of obstetric patients critically ill in the ICU reduces maternal mortality and morbidity. ICU doctors should be familiar with the complications of pregnancy and work closely with obstetricians to improve maternal outcomes in these patients.

References

1. Arici S, Karaman S, Dogru H, et al. Obstetric Patients in Multidisciplinary Intensive Care Unit: Retrospective Analysis. *J Contemp Med* 2014; 4: 1.
2. Çeray Y, Yılmaz M, Cengiz M, Kaplan S, Ramazanoğlu A. Evaluation of Obstetric Patients Who Were Admitted to the Intensive Care Unit. *Türk Yoğun Bakım Derg.* Published online 2017; 124-129.
3. Storgaard M, Loft A, Bergh C, et al. Obstetric and neonatal complications in pregnancies conceived after oocyte donation: a systematic review and meta-analysis. *BJOG An Int J Obstet Gynaecol* 2017; 124: 561-572.
4. Demirkiran O, Dikmen Y, Utku T, Urkmez S. Critically ill obstetric patients in the intensive care unit. *Int J Obstet Anesth* 2003; 12: 266-270.
5. Tezcan Keleş G, Topçu İ, Kefi A, Ekinci Z, Sakarya M. Obstetric Cases in the Intensive Care Unit. *Fırat Tıp Derg* 2006; 11: 62-65.
6. Pollock W, Rose L, Dennis C-L. Pregnant and postpartum admissions to the intensive care unit: a systematic review. *Intensive Care Med* 2010; 36: 1465-1474.
7. Chantry AA, Deneux-Tharaux C, Bonnet MP, Bouvier-Colle MH. Pregnancy-related ICU admissions in France: Trends in rate and severity, 2006-2009. *Crit Care Med* 2015; 43: 78-86.
8. Haque R, Rahman M, Jahan S, Begum K. Critically Ill Obstetric Patients Treated in Intensive Care Unit: a Study in a Tertiary Care Institution 2017;5(cc).
9. Mabie WC, Sibai BM. Treatment in an obstetric intensive care unit. *Am J Obstet Gynecol* 1990; 162: 1-4.
10. Leung N, Lau A, Chan K, Yan W. Clinical characteristics and outcomes of obstetric patients admitted to the Intensive Care Unit: a 10-year retrospective review. *Hong Kong Med J* 2010; 16: 18-25.
11. Ghike S, Asegaonkar P. Why Obstetric Patients are admitted to Intensive Care Unit? A Retrospective Study 2012; 4: 90-92.
12. Graham SG, Luxton MC. The requirement for intensive care support for the pregnant population. *Anaesthesia* 1989; 44: 581-584.
13. G L. Original Article Indications and outcome for intensive care unit admission during puerperium. *Arch Gynecol Obs* 2001; 265: 195-198.