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Nursing Care of Pregnant Patients in the Intensive Care Unit

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Abstract Physiological changes occurring during pregnancy may, in some cases, necessitate admission to the intensive care unit (ICU). Pregnant patients admitted to the ICU typically require intensive medical care due to conditions such as preeclampsia, eclampsia, Haemolysis, Elevated Liver enzymes, and Low Platelet count syndrome (HELLP) syndrome, sepsis, postpartum haemorrhage, and cardiopulmonary complications. This review article discusses the fundamental principles of nursing care for pregnant patients in the ICU, management strategies for physiological changes, the multidisciplinary team approach, and recommendations for improving patient outcomes. A comprehensive evaluation of clinical nursing practices is provided based on a literature review of current scientific studies.

Keywords Pregnancy · Intensive care · Nursing care · Maternal morbidity · Obstetric care

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INTRODUCTION

Pregnancy is a significant process in women's health, involving major physiological changes for both the mother and the foetus. Although the natural course of pregnancy generally progresses healthily, some expectant mothers may encounter severe complications that, can become life-threatening (1). According to the World Health Organisation (WHO), approximately 295,000 women worldwide die each year due to of and childbirth-related complications (2). Certain clinical conditions arising during pregnancy necessitate urgent intervention for maternal and foetal health, making admission to the ICU unavoidable.

Obstetric conditions that require intensive care include preeclampsia, eclampsia, HELLP syndrome, severe sepsis, postpartum haemorrhage, and cardiovascular complications (3). Literature indicates that the rate of ICU admissions due to severe pregnancy-related health problems ranges between 1% and 3% (4). A significant proportion of pregnant patients in the ICU are admitted during the antepartum period for maternal stabilisation, while postpartum complications also increase the need for intensive care (5).

Physiological changes occurring during pregnancy can complicate patient management in the ICU. Increased blood volume and cardiac output elevate the prevalence of hypertensive disorders and congestive heart failure in pregnant women, while respiratory system changes heighten the risk of hypoxia (6). Additionally, the immunosuppressed state in pregnancy increases susceptibility to sepsis (7). Given these factors, the care of pregnant patients in the ICU requires an experienced team and specialised nursing practices.

This study comprehensively examines the nursing care of pregnant patients admitted to the ICU, emphasising the roles of nurses, patient monitoring protocols, and the multidisciplinary approach. Furthermore, it presents evidence-based best care practices and proposed solutions to the challenges faced by pregnant patients in intensive care.

PHYSIOLOGICAL CHANGES IN PREGNANCY AND INTENSIVE CARE MANAGEMENT

Pregnancy induces extensive physiological changes in the female body, and these adaptations significantly impact patient management in the ICU. Therefore, a detailed understanding of the physiological alterations that occur during pregnancy is crucial for providing optimal care in the ICU (7).

Cardiovascular Changes

During pregnancy, the cardiovascular system undergoes significant changes. Blood volume increases by 40-50%, with 75% of this increase resulting from plasma volume expansion. This leads to an increase in the mean erythrocyte volume. The daily iron requirement during pregnancy is 6-7 mg, decreasing serum iron levels while increasing the iron binding capacity. The leukocyte count rises and can reach levels of 25,000-40,000/mm³ during labour, returning to normal in the puerperium period. Fibrinogen levels and erythrocyte sedimentation rate increased. Most coagulation factor levels rise, contributing to a hypercoagulable state during pregnancy. These changes should be considered in the ICU for managing thromboembolic risks (8).

Respiratory System Changes

The respiratory system also undergoes significant adaptations during pregnancy. Minute ventilation increases, the diaphragm elevates, and the subcostal angle widens. The functional residual capacity and residual volume decrease (3). Minute volume, alveolar ventilation, and resting oxygen consumption increase (5). However, there was no significant change in the overall respiratory function. These changes may influence the need for respiratory support in the ICU (8).

Renal and Metabolic Changes

Pregnancy also induces notable changes in the renal system. Both kidneys increased in volume by approximately 30%, with more pronounced enlargement on the right side. The ureters dilate, the glomerular filtration rate increases by 50%, and the renal plasma flow rises by 25-50%. The filtration of glucose in the glomeruli increases while the tubular reabsorption slightly decreases, leading to glycosuria. The daily urine output increases by approximately 25%. These changes necessitate close monitoring of the fluid and electrolyte balance in the ICU (9).

These physiological changes should be considered when monitoring and managing pregnant patients in the ICU. Nurses and healthcare professionals can optimise care and prevent potential complications by understanding these adaptations (10).

NURSING CARE OF PREGNANT PATIENTS IN THE INTENSIVE CARE UNIT

Complications that arise during pregnancy may, in certain cases, necessitate the admission of expectant mothers to the ICU. In this critical process, nurses play a pivotal role by adopting a comprehensive care approach that addresses the physiological, psychological, and social needs of pregnant patients.

In the nursing care of pregnant patients admitted to the ICU, potential nursing diagnoses can be identified in accordance with the North American Nursing Diagnosis Association- International (NANDA-I) classification system. Considering the physiological changes associated with pregnancy and the critical care environment, patients are at risk of various complications. The risk for decreased cardiac output may develop due to the increased circulatory demands of pregnancy and potential cardiovascular

compromise. Changes in the respiratory system, such as diaphragm elevation and reduced functional residual capacity, predispose patients to the risk of ineffective airway clearance. Due to alterations in renal function and increased metabolic demands, patients may experience a risk for imbalanced fluid volume or risk for electrolyte imbalance. The ICU environment, combined with pregnancy-induced immunological changes, also increases the risk of infection. Furthermore, being admitted to the ICU can cause significant psychological distress, resulting in Anxiety or Fear. Respiratory changes and the increased oxygen consumption during pregnancy may contribute to Impaired Gas Exchange, while immobility and oedema can lead to a Risk of Impaired Skin Integrity. These nursing diagnoses form the basis for developing individualised care plans aimed at promoting maternal and foetal health outcomes (14,15).

A fundamental aspect of nursing care in the ICU is the accurate identification of nursing diagnoses and the development of individualised care plans. The use of standardised terminology in nursing documentation enables nurses to make precise clinical decisions and reduces the likelihood of errors during the implementation of care interventions (8).

Continuous monitoring of vital signs is essential to detect early signs of deterioration. Parameters such as blood pressure, pulse, respiratory rate, oxygen saturation, and body temperature must be regularly assessed to ensure timely interventions (6).

Maintaining the fluid and electrolyte balance is another critical responsibility. Due to the increased blood volume and altered metabolic demands of pregnancy, careful monitoring of fluid intake and output is necessary. Early detection of imbalances and prompt corrective actions can prevent serious complications (6).

The management of infection risk is a key priority in the ICU setting. Pregnant women, who are more vulnerable to infections due to physiological immunosuppression, require strict adherence to aseptic techniques. Proper hand hygiene practices and minimising the use of invasive procedures are effective strategies to reduce infection risks (2,11).

Psychosocial support forms an integral part of holistic care. The ICU environment can be highly stressful for pregnant patients, and addressing their emotional and psychological needs is crucial. Nurses should facilitate communication with family members and offer empathetic support to promote the patient's emotional well-being and recovery (12,13).

Finally, patient and family education is vital for fostering active participation in the care process. Nurses should provide clear and consistent information regarding the patient's condition, ongoing treatments, and care procedures, helping to alleviate anxiety and improve cooperation (8).

MULTIDISCIPLINARY APPROACH

The management of obstetric patients in the ICU requires collaboration among specialists from various disciplines, including obstetricians, anaesthesiologists, intensivist, neonatologists, and nurses. This team evaluates the patient's condition, develops treatment plans, and coordinates interventions. Such collaboration is effective in reducing maternal and foetal mortality and morbidity rates (13).

The roles of team members are specific and complementary. Obstetricians manage the diagnosis and treatment of pregnancy-related complications, while anaesthesiologists are responsible for pain management and anaesthesia administration during surgical procedures. Intensivists oversee the general management of critically ill patients, and neonatologists provide care for newborns. Nurses play a pivotal role in ensuring the continuity, safety, and quality of patient care in the ICU. Their responsibilities extend far beyond the monitoring of vital signs and the implementation of prescribed treatment plans. Nurses are actively involved in conducting holistic and continuous patient assessments, recognising early signs of clinical deterioration, initiating timely interventions, and adapting care plans according to the evolving needs of both the mother and foetus. In addition to managing physiological needs, they provide essential psychosocial support, help alleviate patient and family anxiety, and foster emotional resilience during critical illness. Nurses also assume a central role in patient and family education, promoting informed participation in care decisions and improving adherence to treatment. Furthermore, they are instrumental in coordinating the efforts of the multidisciplinary team, ensuring seamless communication among obstetricians, intensivist, neonatologists, anaesthesiologists, and other healthcare professionals. By advocating for patient rights, maintaining safety standards, implementing evidence-based practices, and contributing to ethical decision-making processes, nurses ensure a comprehensive, patient-centred, and team-integrated approach to the management of critically ill pregnant women. Their leadership and professional judgement are indispensable for optimising maternal and foetal outcomes in the intensive care setting (15,16).

A robust multidisciplinary model includes regular team meetings, the use of maternal early warning systems (MEWS), and the development of standardised care bundles for common obstetric emergencies such as haemorrhage, hypertensive crises, and sepsis (15, 16). Maternal Early Warning Systems (MEWS) are structured clinical tools that prompt immediate evaluation when predefined vital sign thresholds are breached. These systems aim to detect early signs of clinical deterioration by monitoring key parameters such as blood pressure, heart rate, respiratory rate, temperature, and mental status. Their implementation has been associated with reduced morbidity by facilitating timely intervention in obstetric emergencies. Additionally, simulation-based training programmes

aimed at improving teamwork and crisis management have demonstrated positive outcomes in maternal critical care (17).

Moreover, the involvement of specialised maternal-foetal medicine consultants, when available, enhances the tailored care of complex cases, ensuring better outcomes. Obstetric and critical care societies at both national and international levels increasingly recommend such models of care.

CONCLUSION

Complications arising during pregnancy can have serious consequences for maternal and foetal health and, in some cases, may necessitate admission to the ICU. The physiological changes occurring during pregnancy make patient management more complex, highlighting the importance of nurses understanding these changes and implementing appropriate care plans. Cardiovascular, respiratory, renal, and metabolic system changes should be considered as fundamental assessment criteria in patient monitoring, and nursing interventions aimed at preserving maternal and foetal health should be meticulously executed.

The nursing care of pregnant patients in the ICU should be based on evidence-based practices. Regular monitoring of vital signs, maintaining fluid and electrolyte balance, and minimising infection risks are essential aspects of care. Additionally, the psychosocial needs of pregnant patients should be addressed through patient and family education and support programmes. Nurses should not only focus on the physical needs of patients but also provide emotional and psychosocial support to enhance the adaptation of expectant mothers to the care process.

The effective management of pregnant patients in the ICU cannot be achieved solely through the individual efforts of nurses; rather, it requires a multidisciplinary team approach. The coordinated efforts of obstetricians, anaesthesiologists, intensivist, neonatologists, and nurses contribute to preventing maternal and foetal complications and improving patient outcomes. Effective communication and coordination among team members enhance the quality of patient care and facilitate more efficient treatment processes.

In conclusion, the management of pregnant patients in the ICU requires a comprehensive assessment, individualised nursing care, and multidisciplinary teamwork. By adopting evidence-based practices, prioritising patient safety, and using advanced care strategies, nurses play a critical role in preserving maternal and foetal health. In this context, the continuous education of healthcare professionals and their awareness of current clinical practices are essential for ensuring more effective and successful management of pregnant patients in the ICU.

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