International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2020; 4(2): 424-427
Received: 20-01-2020
Accepted: 22-02-2020

Dr. Vanitha MG
Assistant Professor, BGS-Global Institute of Medical Sciences, Bangalore, Karnataka, India

Dr. Rashmi KS
Assistant Professor, BGS-Global Institute of Medical Sciences, Bangalore, India

Dr. Srividya S
Consultant Obstretrician &Gynaecologist, Mahaveer Jain Hospital, Bangalore, Karnataka, India

Corresponding Author:
Dr. Rashmi KS
Assistant Professor, BGS-Global Institute of Medical Sciences, Bangalore, India

Pregnancy related admissions to high dependency unit-clinical characteristics & outcome

Dr. Vanitha MG, Dr. Rashmi KS and Dr. Srividya S

DOI: https://doi.org/10.33545/gynae.2020.v4.i2g.562

Abstract
Introduction
Critical care in obstetrics has received much attention in recent times. Despite progress in medical field and improvement in health facilities provided, maternal mortality is still very high in most of the developing countries. A critically ill obstetric patient usually recovers rapidly after delivery resulting in a short length of stay with a reduced number of specific interventions in Intensive care unit (ICU) and a good overall prognosis [1]. These patients may require frequent monitoring of vital signs and/or interventions [2]. Hence, it was contemplated about the possible management of these patients in High Dependency Unit [1]. High dependency Unit (HDU) has been proposed as a more appropriate means of resource utilization for these patients.
Aims and Objectives
To study the indications for admission, interventions required and the outcome of the women's stay in HDU, in terms of morbidity.
Material and Methods
The present study is a prospective observational study done over a period of one year in tertiary care hospital. Total of 60 cases with high risk pregnancy admitted in HDU, were included in present study after satisfying inclusion and exclusion criteria. Indications for admission to HDU, interventions required and outcome were studied.
Results
A study of 60 obstetric patients admitted to HDU in delivery suite was conducted. In present study, the most common indication for admission to HDU was severe preeclampsia, accounting for 21.7% of the admissions. The next common indication was cardiac disease, accounting for 15% of admissions. HELLP accounted for about 13%, PPH for 11% and coagulopathy for 10% of the admissions. In the present study, 33% of patients received about 3-5 blood transfusions and 21% received more than 5 blood transfusions. Majority of the patients (72%) admitted to HDU required oxygen administration and about 70% of the patients received medical intervention in the form of antihypertensives /anticonvulsants / anticoagulants/diuretics and Digoxin. In the present study, majority of the cases (95%) admitted to HDU were transferred out to wards. Only about 5% of them were shifted to I.C.U and all of them required ventilatory support.
Conclusion
Most of the obstetric complications needing critical care could be managed in HDU with the expert obstetric care. The need for mechanical ventilation became the major indication for maternal ICU admission with an increasing number of patients with haemodynamic instability being managed within the HDU. The antenatal patients also benefit from combined obstetric and critical care management. HDU also provides a multi-disciplinary care from all the specialities and the cost saving is considerable as compared to ICU.

Keywords: high dependency unit, obstetric indication, maternal morbidity, pregnancy complication, ICU

Introduction
Obstetric patients are generally young and healthy. However, the potential for catastrophic complications is real and despite the therapeutic advances of the last few decades, maternal morbidity and mortality continue to occur. This may be related to the pregnancy itself, aggravation of a preexisting illness, or complications of the delivery [1]. The majority of women during their pregnancy, labour and postnatal periods require care and support that can be met through routine obstetric care. A small but significant number however, have conditions related to their pregnancy that will be life threatening to them and their baby and require high dependency care [2].

A critically ill obstetric patient usually recovers rapidly after delivery resulting in a short length of stay with a reduced number of specific interventions in Intensive care unit (ICU) and a good overall prognosis [4]. In acute care hospitals, one can identify patient population that does not require intensive care but needs more care than that provided on the floor. These patients may require frequent monitoring of vital signs and/or interventions [5]. Hence, it was contemplated about the possible management of these patients in High Dependency Unit [4]. High dependency Unit (HDU) has been proposed as a more optimal means of resource utilization for these patients.

Material and Methods

The present study is a prospective observational study done over a period of one year in tertiary care hospital. All patients admitted to High Dependency Unit irrespective of direct admission or transfer in from ICU over a period of one year. Ethical committee approval was obtained as per the standard protocol. Informed consent was taken from all the patients.

Inclusion Criteria

- High risk obstetric patients who are either Referred or Booked cases.
- Antenatal or intrapartum or postpartum cases.
- Obstetric complications – Severe Pre-eclampsia/ Eclampsia/PPH/DIC/HELLP/ APH.
- Medical disorders in pregnancy - Jaundice/Heart disease/Renal disease/Diabetic emergencies.
- Transferred in patients from ICU.

Exclusion Criteria

- Patients requiring mechanical ventilation.
- Patients requiring hemodynamic monitoring with pulmonary artery/ intra-arterial catheterization or invasive intra-arterial pressure monitoring.
- Patients with Sepsis and Septic Shock.
- Patients with Multisystem failure.

Complete detailed history was taken. Examination including general physical and obstetric examination was carried out. Investigations and interventions were done relevantly as per the case. Treatment was given as necessitated. Patients were transferred to the ward/ICU as per the condition. Complications, morbidity and mortality were studied.

Observation and Analysis

Prospective study of clinical characteristics and outcome in 60 Obstetric patients admitted to High Dependency Unit during the study period of one year.

Table 1: Admission to High Dependency unit (HDU)

Admission	Number (n=60)	%
Direct	43	71.7
Transfer in from ICU	17	28.3
Total	60	100.0

In the present study, 43 patients were admitted directly to HDU, accounting for 72% of all the cases. The remaining 17 patients (28%) were shifted from ICU after the patient's condition was stabilized and warranted further HDU care.

Table 2: Indications for admission

Indications	Number (n=60)	%
Severe pre-eclampsia	13	21.7
HELLP	8	13.3
Cardiac cases	9	15.0
PPH	7	11.7
Coagulopathy / DIC	6	10.0
Ante Partum Haemorrhage/Abruption	3	5.0
Adherent / Retained Placenta	3	5.0
Ruptured Ectopic Gestation	2	3.3
Eclampsia	2	3.3
Jaundice	1	1.7
AFNL	1	1.7
Severe anemia	1	1.7
Takayasu's Arteritis	1	1.7
Diabetic Ketoacidosis	1	1.7
SLE flare	1	1.7
CVT	1	1.7
Total	60	100.0

In present study, the most common indication for admission to HDU was severe pre-eclampsia, accounting for 21.7% of the admissions. The next common indication was cardiac disease, accounting for 15% of admissions followed by HELLP, PPH and DIC/Coagulopathy accounting for 13.3%, 11.7% and 10% admissions respectively. Antepartum hemorrhage (Abruption placenta) and III stage complications (Retained and Adherent placenta) accounted for 5% of the admissions. Eclampsia and ruptured Ectopic gestation accounted for 3.3% of the admissions.

The remaining indications (CVT, SLE flare, Diabetic ketoacidosis, severe anemia, Takayasu's arteritis, Jaundice, AFNL) were all single cases, each accounting for 1.7% of the admissions.

Table 3: Details of the patients transferred-in-from ICU

Indication for admission to ICU	No. of patients (n=17)
PPH	4
HELLP	4
Congestive Cardiac Failure	1
Cardiac Arrhythmias	1
Coagulopathy/DIC	4
AFNL	1
Convulsions(C.V.T/Eclampsia)	1 + 1

In the present study, of the 17 transfer-in ICU patients; 4 patients were admitted to ICU for PPH, 4 for HELLP, 4 for DIC/ coagulopathy, 2 for convulsions (one for ante-partum eclampsia and the other for convulsions following delivery due to CVT), 1 for AFNL, 1 for Rheumatic heart disease with failure and the other patient with cardiac arrhythmias.

Table 4: Monitoring

Monitoring	Number (n=60)	%
Invasive Monitoring	15	25.0
Non Invasive monitoring	45	75.0
Total	60	100

Central venous cannulation was the only invasive monitoring done in HDU. CVP was monitored in 15 patients (25%) admitted to HDU. Other patients received continuous non-invasive monitoring with meticulous nursing care.

Table 5: Details of Medical Intervention

Medical Intervention	n/60	%
Anti hypertensives	25 /60	41.6
Magnesium Sulphate	20/60	33.3
Frusemide	16/60	26.6
Anti-coagulants	5/60	8.33
Digoxin	2/60	3.33

In the present study, about 42% of patients received anti-hypertensives, 33% patients' anti-convulsants, 27% patients diuretics, 8% patients anti-coagulants and 3% received Digoxin therapy. Digoxin was given in 2 cardiac patients, accounting for about 22.2% of cardiac cases. Anti-coagulant therapy was given in 5 patients, of whom 2 patients received HMW heparin alone, 1 patient received LMW heparin alone and 2 other patients received a combination of Warfarin and
Heparin. Full dose Magnesium Sulphate was given in 9 patients and 11 patients received prophylactic dose of $MgSo_4$.9 patients received single anti-hypertensive and a combination of different anti-hypertensives was given for 16 patients.

Table 6: Surgical intervention

Surgical intervention	n/60	%
LSCS	32/60	53.3
Packing	8/60	13.3
Tear suturing	5/60	8.3
Obstetric Hysterectomy	3/60	5.0
Laparotomy	2/60	3.3
MRP	3/60	5.0
Evacuation	1/60	1.7

In the present study, 53.3% of the patients underwent Caesarean section. Uterine packing was done in 8 patients with PPH; tear (cervical and vaginal) suturing in 5 patients with PPH accounting for 13.3% and 8.3% of all cases respectively. 3 patients underwent Obstetric hysterectomy-one for Placenta accreta with PPH, the other patient for Coagulopathy/DIC due to PPH following obstructed labour and one more for HELLP who developed DIC. Laparotomy was done in 2 patients for ruptured Ectopic gestation. MRP was done in 3 patients –in 2 patients for adherent placenta and in the other patient for retained placenta. 1 patient underwent Evacuation for Secondary PPH.

Table 7: Outcome in Antenatal Patients

Outcome in Antenatal patients	Number	%
LSCS	32	72.7
Vaginal delivery	9	20.4
Laparotomy	2	4.5
Obstetric Hysterectomy	1	2.2
Total	44	100.0

In the present study, of the 44 ante-natal patients, 32 patients underwent LSCS and 9 patients had vaginal delivery accounting for 73% and 20% respectively. 2 patients underwent laparotomy for ruptured ectopic gestation and 1 patient underwent Obstetric hysterectomy (caesarean hysterectomy) for obstructed labour with PPH.

Table 8: Transfer out from HDU

Transfer from HDU	Number (n=60)	%
Wards	57	95.0
ICU	3	5.0
Total	60	100.0

In the present study, majority of the patients admitted to HDU were transferred to wards, accounting for 95% of cases. Only about 5% of patients were shifted to ICU due to complications; of which 2 patients were re-admission to ICU and one patient of SLE flare was shifted after 8 days of HDU care for further management. All three patients transferred to ICU required ventilatory support.

Table 9: Morbidity

Morbidity	n/60	%
Febrile	10/60	16.6
Mechanical Ventilation	3/60	5.0
Paralytic ileus	1/60	1.7
Cardiac failure	1/60	1.7
Heart block	1/60	1.7
Post-hysterectomy VVF	1/60	1.7
LRTI	1/60	1.7

In the present study, of the 60 patients, 17 of them suffered from morbidity. About 17% of patients were febrile, 3 patients (5%) needed ventilatory support and were transferred to ICU. One of the 3 patients transferred to ICU also required dialysis in view of SLEflare with nephritis who developed ARF.1 patient referred for PPH post-obstetric hysterectomy, developed VVF.1 cardiac patient with arrhythmias developed heart block and the other patient of RHD went into cardiac failure during delivery.1 patient of HELLP syndrome following surgery developed LRTI on POD_5.1 patient of obstructed labour developed paralytic ileus after caesarean hysterectomy.

Discussion

This study of clinical characteristics and Outcome of obstetric patients admitted to High Dependency Unit after inclusion & exclusion criteria were fulfilled. Informed consent was taken. Analysis of the study has been done.60 obstetric patients, both antenatal and postpartum were admitted to HDU during the one year study period. Mabie and Sibai [15] reported 200 patients admitted during a 3-yr period from 1986 to 1989 to an obstetric ICU located in the labour and delivery suite.

In the present study, 43 patients (72%) were admitted directly to HDU. The remaining 17 patients (28%) were shifted from ICU, once the condition of the patient was stabilized. In the study by Ridley *et al.* [51], 14% of ICU patients were transferred to HDU.

In present study, the most common indication for admission to HDU was severe pre-eclampsia, accounting for 21.7% of the admissions. Cardiac cases accounted for 15%; HELLP for 13%; PPH for 11%; Coagulopathy/DIC for 10%; APH & third stage complications (Retained/Adherent placenta) accounted for 5%; Eclampsia and Ectopic gestation accounted for 3.3% of the admissions. The remaining indications were all single cases, each accounting for 1.7% of the admissions.

This was similar to the study conducted by Ryan *et al.* [35] of patients admitted to HDU where pre-eclampsia accounted for majority (44.7%) of admissions. But in his study PPH accounted for 21%, APH & HELLP for 7% of the admissions.

Mabie and Sibai [15] found that 46% of the patients in an obstetric ICU were admitted for hypertension, 44% were admitted for medical complications, and 10% were admitted for haemorrhages.

In the present study, among 60 patients admitted to HDU, 42 patients (70%) were successfully managed in HDU except for 1 patient (1.7%) with SLE flare who was transferred to ICU for ventilatory support. The remaining 17 patients (28.3%) were transferred to HDU from ICU and were successfully managed.

Majority of the patients admitted to HDU were transferred to wards, accounting for 95% of cases. Only 3 cases (5%) were shifted to ICU due to complications, of which 2 were re-admission to ICU. All three patients transferred to ICU, required ventilatory support.

Mabie and Sibai [15] reported in their study that 4.5% of patients required transfer to a medical ICU. Reasons for transfer to the general medical ICU included initiation of mechanical ventilation, thrombolytic therapy for pulmonary embolism and chronic management of thrombotic thrombocytopenic purpura.

Ryan *et al*. [35] in his study found that 4% of patients were transferred to ICU and the need for mechanical ventilation became the major indication for ICU admission with an increasing number of patients with haemodynamic instability being managed in HDU, consistent with other studies (Kilpatrick, Mabie and Sibai study), including our present study.

Ridley *et al*. [51] in his study found that most high dependency patients were successfully stabilised on HDU, except for 5% who subsequently deteriorated and stepped-up to ICU.

Conclusion

Most of the obstetric complications needing critical care could be managed in HDU with the expertise obstetric care. The need for mechanical ventilation became the major indication for maternal ICU admission with an increasing number of patients with haemodynamic instability being managed within the HDU.

The advantages of an HDU within an obstetric setting included:

- The benefit of critical care facilities with the obvious advantages of keeping mother and infant together combined with improved continuity of postnatal care.
- The antenatal patients also benefit from combined obstetric and critical care management.
- Most important is the reduced cross infections in HDU as compared to ICU.

The results of present study also show a trend towards reduced ICU stay after establishment of HDU with all patients discharged back to HDU for further care, again limiting the duration of mother-infant separation and allowing for prompt institution of postnatal care.

The development of HDU in view of increasing sophistication of care requires resources, both for establishment and running. But once established, the cost of an HDU bed is considerably less than of an ICU bed. It is important to appreciate that a significant proportion of HDU patients will consume more resources in ICU; hence HDU helps in a more efficient delivery of care. Since HDU improves the supply of critical care facilities, it should be made a prominent part of obstetric health care provision.

References

1. Haddad Z, Kaddour C. Nursing workload and prognosis in the critically ill obstetric patient. Critical Care. 2005; 9(1):P215.
2. Nasraway Stanley A, Cohen Ian L, Dennis Richard Howenstein C, Michelle Nikas A, Diana Warren K, Jonathan Wedel *et al.* Guidelines on admission and discharge for adult intermediate care units. Crit Care Med. 1998; 26(3):607-610.
3. Gerda G, Zeeman. Obstetric critical care: a blueprint for improved outcomes. Crit Care Med. 2006; 34(9):S208-14.
4. East Kent Hospitals NHS Trust. Directorate of Women's Health. High Dependency Care of the Obstetric Patient (homepage on the internet).Guidelines for clinical practice-Guideline No 35. 2008 Nov. Available from:www.ekhut.nhs.uk/.../women's-health/...guidelines/clinical-Haddad Z and Kaddour C. Nursing workload and prognosis in the critically ill obstetric patient. Critical Care 2005 March; 9(1):P215.
5. Mabie WC, Sibai BM. Treatment in an obstetric intensive care unit. Am J Obstet Gynecol 1990; 162:1-4.
6. Ryan M, Hamilton V, Bowen M, McKenna P. The Role of a High-Dependency Unit in a Regional Obstetric Hospital. Anaesthesia. 2000; 55:1155-8.
7. Kilpatrick SJ, Matthay MA. Obstetric patients requiring critical care. A five year review. Chest 1992; 101:1407-12.
8. Dhond G, Ridley S, Palmer M. The impact of a high dependency unit on the workload of an intensive care unit. Anaesthesia. 1998; 53:841-847