

## Clinical Study of Admissions in Obstetrics High Dependency Unit of a Tertiary Care Referral Teaching Institute

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### Abstract

*Introduction and Aim:* Critically ill obstetric women in the obstetrics high dependency unit are a challenging situation to the obstetricians. The frequency of obstetric admissions that require admissions for critical care in the ICU and HDU is on the rise. Overall the obstetric admission in ICU in our institute varies from 4-6% of the deliveries. This study attempts to evaluate the occurrence, indications, progression, interventions and outcomes of these obstetric patients admitted in the obstetric HDU.

*Materials and Methods:* This is prospective observational study of obstetric patients admitted in the obstetric HDU in one year from January 2019 to December 2019 at Bharati Hospital and Research centre attached to Bharati Vidyapeeth Medical college Pune, Maharashtra. All the admissions in a dedicated 6 bed HDU were included in the study. The course of events and outcomes were documented and tabulated. The data will be analysed against the total no of deliveries for the study period. Incidence and prevalence of various obstetric conditions requiring HDU support was studied.

*Results:* In total 414 patients required HDU care during the study duration. 19.11% of all the births during the year required HDU care indicating a high number of high risk pregnancy case load. Maximum admissions to HDU were in second half of gestation or postpartum. Most common indication for admission to HDU was preeclampsia 185 patients (44.68%). Maximum patients (55.31%) were referred from other nursing homes. 35 patients had associated heart disease, 27 had diabetes, 26 patients had associated other endocrine disease.

*Conclusions:* A high incidence of Obstetric HDU admissions was observed in the study as it was conducted in a tertiary care referral teaching hospital with dedicated Obstetric HDU and ICU. An increasing trend of Obstetric admissions is seen due to an increased incidence of high risk pregnancy with maternal age, assisted conception, obesity and underlying medical conditions acting as a major confounding factors. Obstetric HDU will go a long way in prevention of maternal morbidity and mortality.

**Keywords:** High risk pregnancy; obstetric high dependency unit; post-partum haemorrhage; pre-eclampsia; maternal mortality.

### Introduction

Critically ill obstetric women in the obstetrics high dependency unit are a challenging situation to the obstetricians.<sup>1</sup>The frequency of obstetric admissions that require admissions for critical care in the ICU (Intensive Care Unit) and HDU (High Dependency Unit) is on the rise.<sup>2</sup> Overall the obstetric admission in ICU in our institute varies from 4-6% of the deliveries. To provide a proper step-down care to mothers with complicated pregnancies and medical disorders a dedicated 6 bed Obstetric HDU was made functional. This study attempts to evaluate the occurrence, indications, progression, interventions and outcomes of these obstetric patients admitted in the obstetric HDU.

There are various pregnancy related conditions

that needs critical care admission.<sup>1</sup> The complications of pregnancy and labour are mainly two types, first obstetric complications like PPH, pre-eclampsia, eclampsia which require intensive obstetric care by specially trained providers and second set of complications like multi organ involvement which need care by intensivist and super specialist like Nephrology, Neurology, Cardiology, Pulmonology etc.<sup>2</sup> Multidisciplinary team approach is the cornerstone in the management of obstetric admissions in ICU.<sup>3</sup>

The altered physiology of pregnancy, the rapid deterioration of maternal and foetal condition if there is a complication, and the simultaneous management of two lives with different physiologies are a challenge.<sup>4</sup> Occupancy of Intensive Care Units by pregnant patients can be considered as modality to assess severe and near miss maternal morbidity.<sup>5</sup>

Who quotes that 'there is a story behind every maternal death or life threatening complication.<sup>6</sup> So a better knowledge of disease associated with pregnancy is the first step to prevention and hence reduction of both maternal morbidity and mortality.

## Materials And Methods

This study was a prospective observational study conducted in Bharati Hospital, Pune a tertiary care teaching referral hospital with 6 bedded dedicated obstetric HDU and 79 bedded medical ICU. After obtaining institutional ethics committee approval, pregnant women who were admitted in the HDU during a period of Jan 2019 to Dec 2019 were included in the study.

A pro forma for all admissions in the HDU was filled. The data collected was age of the patient, gestational age at the time of admission, associated major obstetric and medical condition, and duration of HDU stay, maternal and neonatal outcome, referred or booked.

The patients who were shifted to the HDU as a step-down from the ICU were also included. To study the disease burden in the subject the gynaecological conditions which required HDU were also studied and analysed.

### Inclusion Criteria

All antenatal women irrespective of period of gestation and postnatal women within 42 days of delivery requiring HDU admission for obstetric, non obstetric reasons, irrespective of age, parity, mode of delivery and co morbid conditions.

### Exclusion Criteria

Patients requiring ICU admission after 42 days of delivery.

Statistical analysis was done by SPSS version 22 and conclusions were drawn.

## Results

In study period total numbers of deliveries were 1920. During the study period of one year total 414 patients were admitted to HDU. Total obstetric admissions were 367. This considered 19.11% of total deliveries.

**Table 1:** Age Distribution

Age (years)	N= No of patients	Percentage %
<20	21	5
20-25	109	26.3
26-30	145	35
31-35	72	17.3
36-40	27	6.5
>40	40	9.6

As per Table 1 mean maternal age from above study was 28 years.

**Table 2:** Gestational Age on Admission

Gestational Age (weeks)	N=No of patients	Percentage %
<14 week	23	6.26
15-28 week	70	19
29-34 week	103	28
>34 week	171	46.5

Table 2 shows that maximum admissions to HDU were in later part of gestation or postpartum.

**Table 3:** Timing of Admission to HDU

Timing	N=No of patients	Percentage %
Antepartum	107	29.1
Postpartum	260	70.8

Table 3 shows that total admissions in postpartum period were 260 (70%).

**Table 4:** Duration of HDU Stay

Duration (days)	N=No of patients	Percentage %
<2 days	187	45.1
2-4 days	136	32.8
>4days	91	21.9

Duration of HDU stay in majority of patients was less than 2 days (45.1%) as per Table 4. Majority of patients were stabilised with initial management and then shifted to obstetric wards.

**Table 5:** Maternal Outcome

Outcome	N=No of patients	Percentage %
Improved	356	97
Death	1	0.27
LAMA	10	2.72

Table 5 shows that 97% patients improved

admitted to HDU.10 patients took discharge against medical advice. There was one maternal death in one year study period; it was due to Dengue Shock Syndrome.

**Table 6:** Registration Status

Registration status	N=No of patients	Percentage %
Booked	144	39.23
Un-booked	20	5.44
Referred	203	55.31

As per Table 6 majority of patients admitted to HDU were referred (55.31%). As critically ill obstetric patient needs multidisciplinary approach, our institute being tertiary care centre critical patients are referred.

**Table 7:** Primary Diagnosis at the Time of Admission

Primary diagnosis at the time of admission	N=No of patients	Percentage %
Pre-eclampsia	185	44.68
Chronic hypertension	6	1.44
Gestational hypertension	6	1.44
Eclampsia	13	3.14
HELLP Syndrome	8	1.93
Severe Anaemia	45	10.8
Puerperal sepsis	1	0.24
DIC	1	0.24
Obstetric Hysterectomy	4	0.96
Oncology	4	0.96
Ruptured Uterus	4	0.96
Post hysterectomy (gynaecological)	25	6.03
Other gynaecological admissions	5	1.20
Ectopic Pregnancy	14	3.38
Morbidly adherent placenta	2	0.48
Abortion	5	1.20
Placental Abruption	32	7.72
Placenta previa	8	1.93
PPH	20	4.83

Table 7 shows that most common indication for admission to HDU was preeclampsia 185 patients (44.68%). Then severe anaemia was second common indication requiring HDU admission 45 patients (10.8%), followed by placental abruption 32 patients (7.72%). PPH (postpartum haemorrhage) accounted for 4.83%, Eclampsia for 3.14%, HELLP for 1.93% of HDU admission. Ectopic pregnancy accounted for 3.38% of admission to HDU

Amongst gynaecological patients requiring HDU admission 25 patients were post hysterectomy due to associated co morbid condition or post on co-surgery. 5 patients were admitted for ovarian torsion, 4 admission were for oncology. 4 patients

were referred for post MTP uterine perforation.5 patients were admitted for post abortion severe anaemia.

**Table 8:** Associated Medical Disorder

Associated Medical Disorder	N=No of patients	Percentage %
Heart Disease	35	8.45
Diabetes Mellitus	27	6.52
Acute Kidney Injury	1	0.24
Liver Disorders	4	0.96
Pulmonary disease (ARDS)	6	1.44
Endocrine Disorders	26	6.28
Thrombocytopenia	3	0.72
Viral infections including (Dengue/ H1N1)	5	1.20
Febrile illness (Malaria,UTI,etc)	6	1.44
Pregnancy with acute abdomen	2	0.48
Neurological condition	7	1.69
Obesity and Pregnancy	3	0.72
Other obstetric condition	6	1.44

As per Table 8, 35 patients had associated heart disease, 27 had diabetes, and 26 patients had associated other endocrine disease. One patient developed acute kidney injury due to severe PPH needed dialysis.

## Discussion

Pregnancy is a physiological condition but sometimes it can lead to potentially life threatening complications. Adequate medical and surgical back-up is needed to tackle these emergencies.

The present study almost 19% of all the total births in our hospital required HDU care. This high incidence of HDU admissions is due to the hospital being a state of the art institute for referral of high risk pregnancies. A study by Panda et al quoted a incidence of 16% obstetric admissions in there study of HDU admissions.<sup>7</sup> 11.3% of births required HDU care in a study by Veerabhadrapa et al.<sup>8</sup>

The commonest condition requiring HDU care was preeclampsia (44.6%), highlighting the higher incidence of this condition in pregnancy. The women with preeclampsia who required HDU care were elderly, obese, had assisted reproduction and had underlying medical disorders. Uncontrolled preeclampsia leading to eclampsia and HELLP syndrome was a common reason for transfer of these patients from other hospitals. Few Indian studies have reported pregnancy related hypertensive complications to be the most important cause of HDU admission same as our study.<sup>9,10</sup>

Severe anaemia [haemoglobin < 7 gm%] was the other common indication for HDU care (10.8%). Anaemia is the commonest preventable medical condition in pregnancy and is an important confounding factor for preeclampsia, foetal growth restriction and post-partum haemorrhage. Management of these critically ill mothers requires blood products, intensive monitor of the vital parameters and investigation for the cause.

Postpartum haemorrhage leading to shock and requiring hemodynamic monitoring was in 4.8% of patients. Antepartum haemorrhage including placental abruption (7.7%) and placenta previa (1.9%) are potentially life threatening conditions requiring HDU care.

Commonest medical disorders requiring HDU care are pregnancy complicated with Diabetes mellitus, heart disease, thrombocytopenia, endocrine diseases including thyroid dysfunction and acute kidney injury.

The need of HDU care was high in unbooked and unregistered patients highlighting the need of proper meticulous antenatal care for primary prevention of the complications.<sup>11,12</sup>

## Conclusion

Critical lifesaving obstetric care continues to be one of the major focus areas for Government of India. National guidelines on Obstetric ICUs/HDUs (2016) provide recommendations for establishing Obstetric ICU/HDU in all medical colleges.<sup>13</sup>

In lieu with the Government of India guidelines the Obstetric HDU provides an important access to intensive care for mothers suffering from life threatening obstetric complications. Coordinated efforts between the obstetricians trained in critical care and intensive care specialists are needed to empower these units.

The present study highlights that hypertensive disorders of pregnancy, anaemia, postpartum haemorrhage, antepartum haemorrhage, endocrine disorders including diabetes and acute kidney injury are the common conditions requiring HDU care and management.

Efforts should be made for primary prevention of these conditions with proper antenatal care with risk assessments. Timely referral to tertiary care units equipped with dedicated obstetric ICU and HDU is the way forward for prevention of maternal morbidity and mortality.

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