

High Dependency Unit- A Boon for High Risk Mother

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Abstract

Background: The management of critically ill obstetric patients has always been a difficult task. High Dependency Unit setup in all over India has helped in curbing various complication and thus helped in reducing maternal morbidity and mortality rate. The objective of this study was to observe the management of patients admitted in High Dependency Unit and compare and evaluate the outcome of the patients during presence and absence of High Dependency Unit.

Materials and Method: This is a retrospective study carried out from May to October in the year 2021 in Department of Obstetrics and Gynaecology, M.K.C.G Medical College Hospital, Berhampur, Odisha. Data's were collected from Hospital information record over a period of 3 months from May to July with no High Dependency Unit and from August to October with fully functioning High Dependency Unit. Patients address, age, socio economic status indication of admission, whether a booked case or unbooked case, preterm or term pregnancy, distance of referral centre, no of hours patient stayed in High Dependency Unit, shock index, no of blood transfusion, application of anti-shock garment, and the outcome of the patient were all noted. Statistical analysis was performed by the SPSS program for Windows.

Results: Obstetrical complication was managed well with intensive monitoring provided by High Dependency Unit set up in M.K.C.G medical college and hospital. A total of 9231 patients were admitted in labour room. Total no of deliveries was 7346. 150 (3.4 %) were admitted in High Dependency Unit. Haemorrhagic cases accounted for, 26 % (n=13), hypertensive cases 16% (n= 8), anemic cases were 6 % (n=3) of total admission in High Dependency Unit. Maximum no of patients was in the age group 23 to 29 years of age group (72.56%), 69% of the patients constitute lower socio-economic status group, 65 % patients reside in rural areas and there was inadequacy in receiving antenatal care in case of 60.6% of patients. Term pregnancy developed more complications (66.6%) than preterm pregnancies. Maximum no of patients stayed in High Dependency Unit 48 to 72 hours. Blood transfusion (72.5%), the use of inotropic drugs (38%), mechanical ventilation (60%) was noted in HDU. A lower Intensive Care Unit of 2.6% was noted with High Dependency Unit, as well maternal mortality ratio of 4.8 per 1000 live births as compared to 6.8 per 1000 live births with no High Dependency Unit.

Conclusion: Haemorrhage cases accounted for most no of cases in High Dependency Unit. Delayed identification and distance of referral centre were important obstacles in hindering the

better outcome of patients. 62.6% (n=94) were unbooked cases. So, increasing awareness and encouraging people to report at health centre at the earliest has to be stressed on. In addition to timely referral, health education and training of health professionals may improve clinical outcome and better obstetric practice, especially in countries like India. Pregnancy itself carries a lot of complication which if not taken care of at the the earliest can lead to devastating results. Hence for easy and smooth management of the patients High Dependency Unit concept was introduced which with the help of advanced facilities and dedicated competent care providers can help avert unforeseen complications arising out in pregnancy. Obstetric High Dependency Unit dedicated for management of only obstetric patients should be constructed in order to compensate for heavy burden critically ill patients.

Keywords: High dependency unit, Critical care, Maternal mortality.

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Introduction

“There is a story behind every maternal death and life-threatening complication” and understanding the lessons to be learnt can help avoid such outcomes [1]. Though pregnancy and labor are considered a physiological process the potential for catastrophic complication is constant and may develop in a matter of minutes. In order to provide specialized care and reduce maternal morbidity and mortality, specialised obstetric intensive care unit and high dependency units need to be established [2].

The proportion of obstetrics patient requiring admission to High dependency unit is 42 per 1000 deliveries in M.K.C.G. medical college. Proportion of obstetrics patient requiring intensive care is 1 to 9 per 1000 deliveries. It has been seen that on site critical care facilities in the form of High Dependency Unit would reduce the need to transfer patients to a general medical or surgical Intensive Care Unit (ICU)[3]. In M.K.C.G medical college Odisha we retrospectively analysed the demographic parameters, reason for admission and outcome of obstetric cases requiring admissions in High Dependency Unit with an aim to review High Dependency Unit setup in terms of utilization rate, indications for admissions, interventions

needed and compare the maternal outcome with no High Dependency Unit.

Materials & Methods

A hospital based retrospective study was conducted in M.K.C.G Medical College and Hospital in Odisha. M.K.C.G medical college and hospital has facilities for antenatal, postnatal, gynaecological care as well as critical care unit with 4 bedded High Dependency Unit. Data's were collected from hospital record from May to July with no High Dependency Unit and from August to October with fully functioning High Dependency Unit. Demographic information, age, parity, booking status, gestational age, distance of referral centre, indication of admission, utilisation of blood, outcome of patient admitted to High Dependency Unit, outcome of baby was obtained from hospital information record. Patients in High Dependency Unit either required intensive care and were transferred to Intensive Care Unit or showed improvement of symptoms were transferred to general ward. Patient vitals were continuously monitored by trained staff nurses and trained health care providers. Patients were followed up till they got discharged from High Dependency Unit or

shifted to Intensive Care Unit for better management.

Selection of patient: All patient admitted to High dependency unit that is all high-risk pregnancy and post-partum mother with complications. Sick patients but not admitted to High Dependency Unit for other reasons, covid positive sick patients were excluded.

Statistical analysis: Data was entered in a spread sheet (excel) and analysis was done by using SPSS software

Results

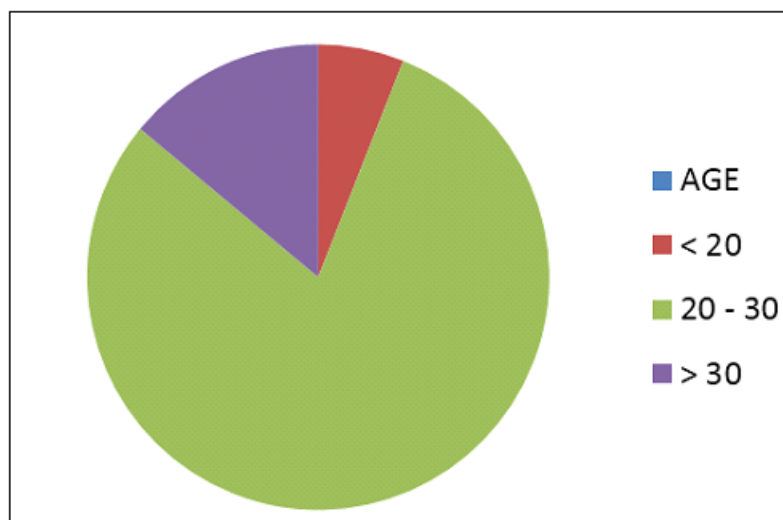
A total of 4342 patients were admitted in Labour room while functioning of High Dependency Unit. The total number of deliveries were 3569 of which the no of live birth was 3478. There were 17 maternal deaths during the study period. The maternal mortality ratio was 4.8 per 1000 live births. With reference to High Dependency Unit admission the total admission was 150. High Dependency Unit cases accounted for 4.2 % of all obstetrics admission. Amongst the 150 subjects, 90 were admitted directly from labour room, another 60 were admitted directly from operation theatre. Out of which 93% were shifted to ward, 4% were shifted to Intensive Care Unit, maternal death was recorded to be 3%. Around 85.6% patients were referred from outside. More than 80% patients were places beyond 50 km distance. No significant difference was seen between two groups with respect to literacy status and distance from centre. Majority of women admitted were primiparous 58.9% and 41.1% of women were multiparous. Increasing parity were associated with increased risk of mortality ($P<0.05$). Postpartum admissions (63%) were more as compared to antepartum admission. 37.4% were booked cases and rest 62.6% cases were unbooked. From the

patients to transferred to ICU 60% cases were unbooked. Around 56% of cases were term cases. The various conditions necessitating HDU admission is shown in table. The most common condition necessitating High Dependency Unit admission were haemorrhagic shock 22%, severe pre-eclampsia (18%), eclampsia (12%), septic shock 10%, hypovolemic shock (10%), placenta praevia (10%), severe anaemia 6%, hellp syndrome with sepsis (6%). Around 12% of women has more than one complication. The most common performed surgical intervention was Lower segment caesarean section (LSCS) in 60%. 69% of the patients required blood and blood products. 38% of patients required inotropic support and 60% were on mechanical ventilation. Live birth of baby was recorded to be 91% and still born was 9%.

With regards to labour room with no High Dependency Unit, Labour room admission was 4889, out of which total deliveries occurred were 3777. The mean age of patients admitted to Labour room was 25.5 years. The minimum and maximum age of pregnant women were 18 and 37 years. 68 % of the patients were primiparous and 32 % were multiparous. Increasing parity was associated with increasing morbidity ($P<0.05$). Antepartum admission was more 71.1% than postpartum admissions (28.9%). The condition necessitating Intensive Care Unit admission were haemorrhagic shock, septicaemia, pregnancy induced hypertension, antepartum haemorrhage. Maternal death ratio was 6.8 per 1000 live birth. Intensive Care Unit admission accounted for 7.1 %. With regard to intervention 68.9% patients were managed conservatively and the rest had to undergo surgical intervention. Live birth was recorded to be 82% while still born was 18%.

Table 1: Demographic parameters of the patient admitted to High Dependency Unit (HDU)

Age group	No of cases admitted to HDU	Percentage%
<20	9	6%
20 – 30	120	80%
>30	21	14%
Socioeconomic status		
Low	93	62%
Middle	30	20%
High	27	18%
Booked or Unbooked case		
Booked	56	37.4%
Unbooked	94	62.6%
Parity		
Primiparous	88	58.9%
Multiparous	61	41.1%
Antepartum	55	37%
Postpartum	95	63%

**Figure 1: Pie chart representation of age group of patients admitted to High Dependency Unit**

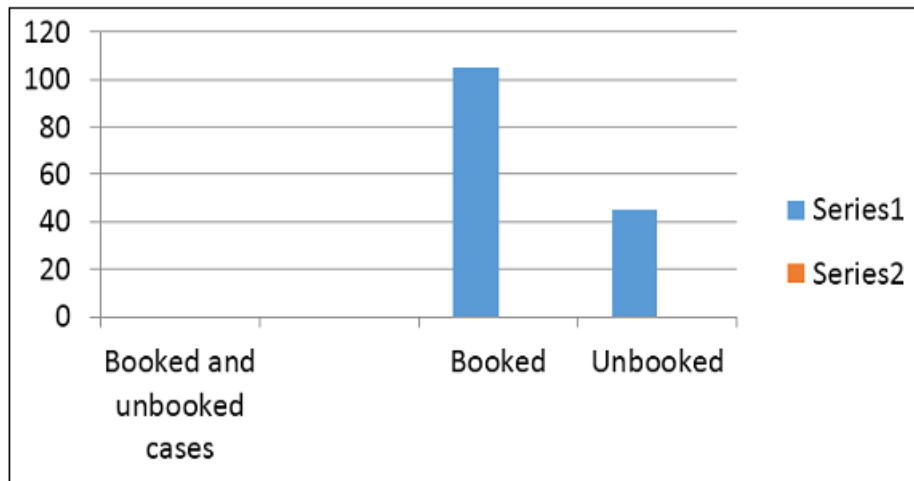


Figure 2: Graphical representation of booked and unbooked cases of High Dependency Unit

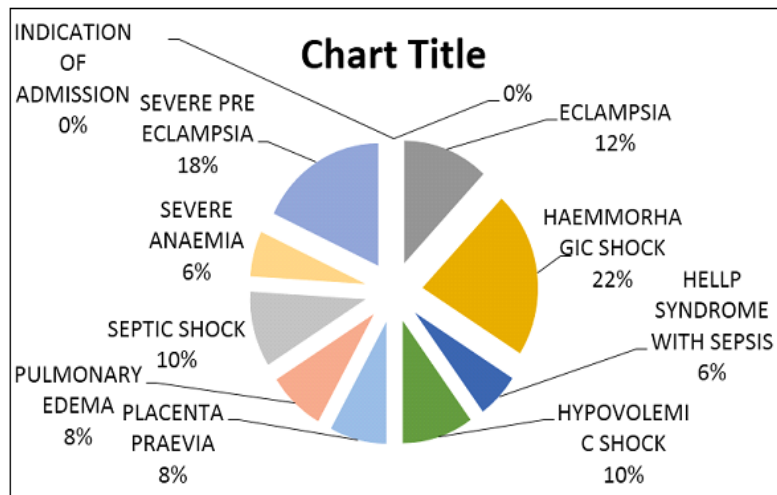


Figure 3: Indication of admission of patients to High Dependency Unit

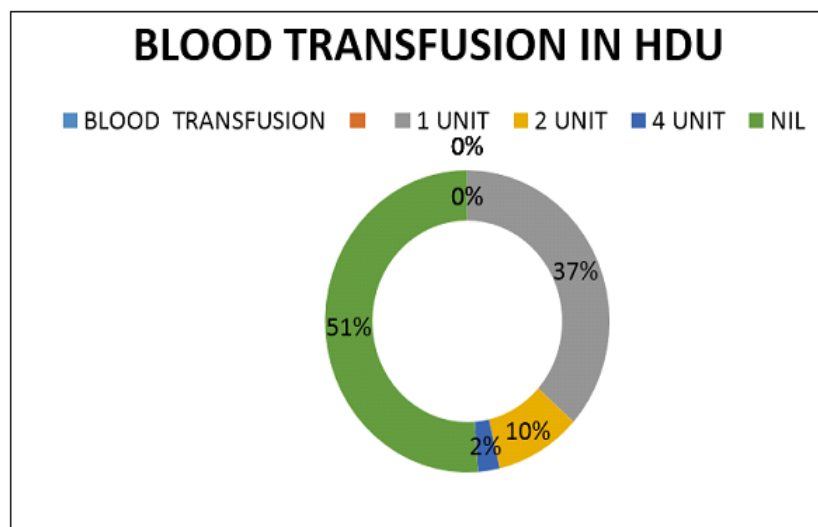


Figure 4: Percentage of unit of blood transfusion in High Dependency Unit

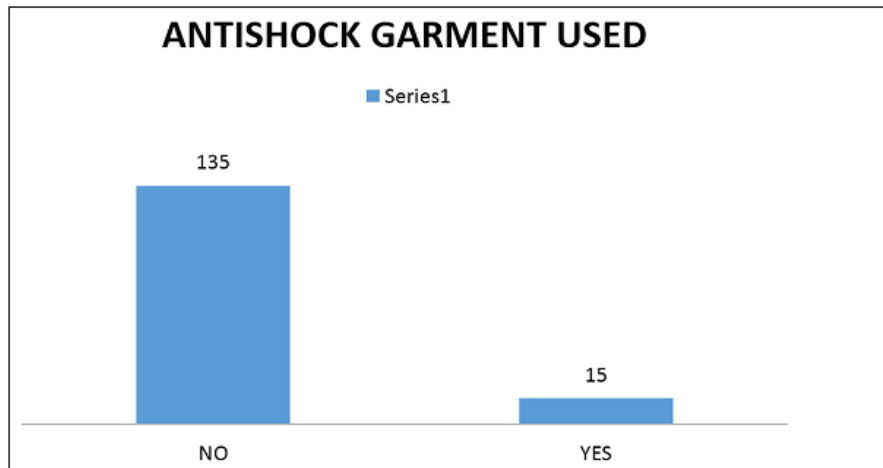


Figure 5: Graphical representation of antishock garment used in High Dependency Unit

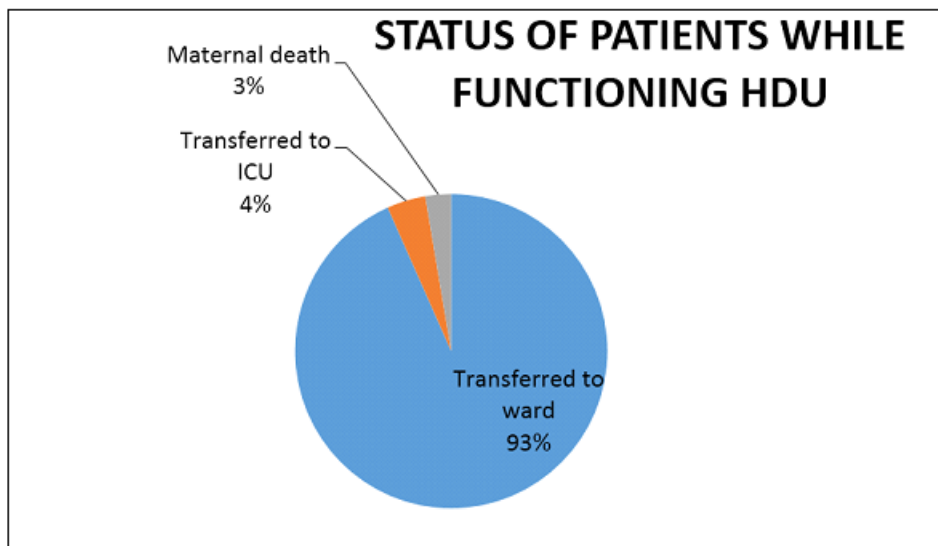


Figure 6: Status of patient with High Dependency Unit

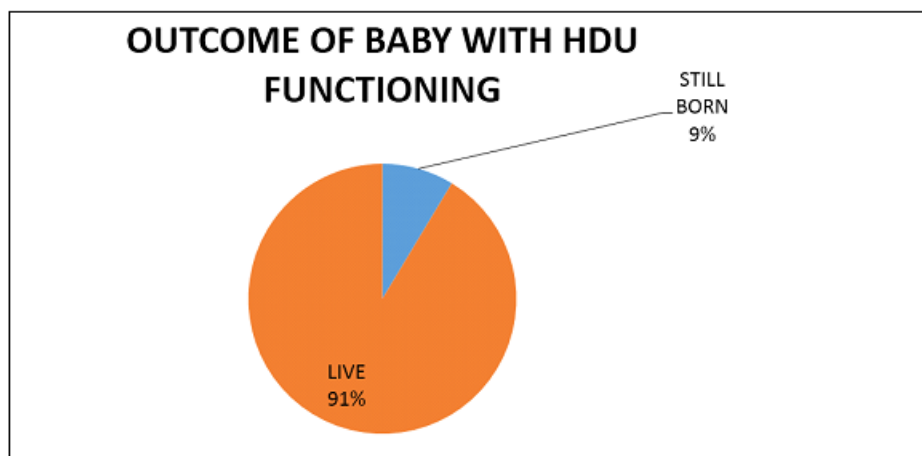


Figure 7: Outcome of baby while functioning of High Dependency Unit

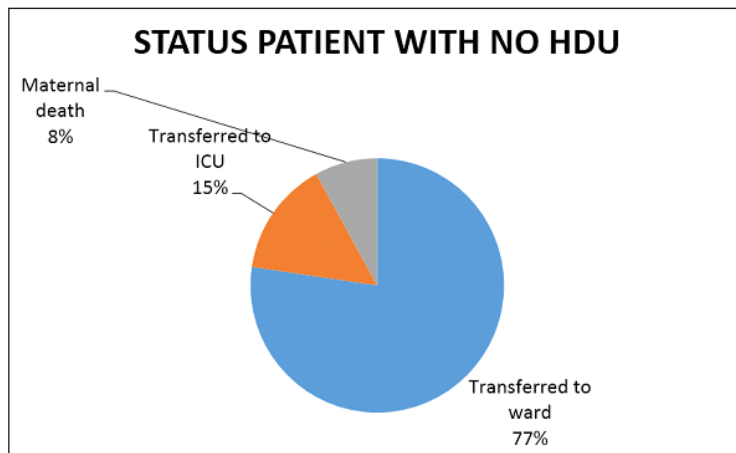


Figure 8: Status of patient with no High Dependency Unit

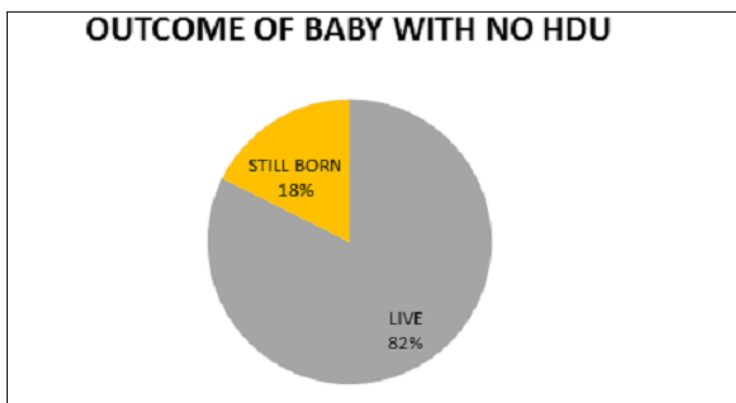


Figure 9: Outcome of baby with no High Dependency Unit

Discussion

The present study included analysis of women who were admitted during functioning of High Dependency Unit and while nonfunctioning of High Dependency Unit. The Intensive Care Unit admission rate with no High Dependency Unit was 7.1% and while functioning of High Dependency Unit is 2.6%. The lower Intensive Care Unit admission rate and lower maternal mortality can be attributed to well-functioning High Dependency Unit. The maternal mortality is only tip of iceberg, the actual burden is much higher [3]. The recent focus has been towards provision of comprehensive emergency obstetrics care in the form of High Dependency Unit and Intensive Care Unit [4]. High dependency Unit care on the other hand is appropriate for patients requiring support

for a single organ system, those who can be benefitted from more close observation and monitoring than can be safely provided in a general ward, patients no longer needing intensive care but cannot be returned to general ward and for post operative patients who require close monitoring and intensive monitoring [5-7].

Management of the critically ill obstetric woman is a unique challenge to obstetricians [8-9]. M.K.C.G medical college and hospital is equipped with High Dependency Unit. Various studies have reported an admission rate of obstetric patients in intensive care as approximately 0.1 -0.9 % of deliveries [10]. There is not much data available with regard to High Dependency Unit admission rate. Going by the data published in other countries the rate is a rough predictor for planning in

case of tertiary centres [11-13]. Majority of the patients admitted in High Dependency Unit was haemorrhage as the most important cause of admission. A few studies done in Indian setting have reported haemorrhage as the most important cause while others have noted pregnancy related hypertensive complications to be the most important cause [14-15]. The higher rate of obstetric compared to medical complications is consistent with findings of other studies.

The state of pregnancy unmasks or worsens the underlying co morbidities. In the study many patients presented with underlying comorbidities like diabetes mellitus, sickle cell anaemia, asthma, cardiac diseases [16]. Most of the patients with underlying heart diseases had to be shifted to Intensive Care Unit. Many studies have found cardiac diseases to be a significant contributor for non-obstetric related mortality [17]. It calls for multidisciplinary approach and advanced mean of monitoring and appropriate expertise [18].

Maternal mortality ratio with High Dependency Unit was 4.8 per 1000 live births with no High Dependency Unit was 6.8 per 1000 live births. The Intensive Care Unit mortality rate during functioning of High Dependency Unit was 14.6 % compared to 22% with no High Dependency Unit. [19] A well-functioning High Dependency Unit contributed to low mortality rate in Intensive Care Unit. Present centre being a tertiary care hospital majority of women had severe complications and many were referred after a significant amount of delay. This emphasizes the point that there may not be much time transfer to Intensive Care Unit in case of obstetric cases and things can turn for the worse pretty quickly.

Conclusions

The study highlights the importance of having on site access to High Dependency Unit for effectively managing and preventing morbidity in critically ill obstetrics patients.

Early detection should be followed by early action, management and escalation. High Dependency Unit acts as step up or step down between labour room and critical care services and is safe and effective when coupled with rapid access to Intensive Care Unit. Hence in every way High Dependency Unit proves to be a boon for mothers.

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Ethical Approval: The article doesn't contain any study involving human participants or animal performed by any of the authors, as it's a retrospective analysis from the hospital records.

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