

Icu Admissions in Maternity Unit of BPSGMCW, Khanpurkalan; A Review

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Abstract: **Background:** Pregnancy can lead to major maternal morbidity with consequences requiring utilization of facilities of Intensive Care Unit (ICU). The aim of this study was to determine the indication for admission, intervention and outcome of obstetric patients admitted to intensive care unit at BPS Medical College Teaching Hospital and also to identify risk factors for admission to intensive obstetric care unit. **Methods:** A hospital based descriptive observational study was conducted from 1 st July 2014 to 31 st July 2015. All obstetric admissions to the ICU up to 42 days postpartum were included. Data obtained included demography, obstetric history, pre-existing medical problems, indication for ICU admission, intervention in ICU and outcome. **Results:** The total numbers of deliveries during this period were 4365. Study population consisted of 56 obstetric cases admitted in ICU. The most common obstetric cause for icu admission in our series was hypertensive disorder of pregnancy (n=24, 42.8%) followed by hemorrhage. 17 cases of mortality were reported. **Conclusion:** Hypertensive disorders of pregnancy and obstetric hemorrhage were the most common indications of ICU admissions in our study. Risk factors for admission included lesser gestational age, caesarean section, blood loss, and co-morbid conditions of the patients. A multidisciplinary team approach is necessary to achieve a safe mother outcome.

1. Introduction

Management of critically ill obstetric patients in intensive care unit is a challenging task. Maternal mortality and morbidity are important quality indicators of safe motherhood. Critically ill obstetric patients require cooperation of obstetrician and intensivists and/or anaesthetists.

Poverty, illiteracy, lack of proper transportation and communication modes, superstitions, lack of awareness, and sociocultural behaviors are instrumental in the provision of quality critical care to obstetric patients.

Young patient's management is hampered by concerns for fetal viability, altered maternal physiology, and diseases specific to pregnancy. Data from India is very few despite huge number and wide stratum of obstetric population.

The incidence of mothers requiring intensive care unit in western part of the country is around 5.48 per 1000 deliveries. This study was done retrospectively to analyze the demographic parameters, reason for admission, course of stay, prognostic factors and final outcome in the intensive care unit. The overall goal is to identify the contributing factors towards maternal morbidity.

2. Methods

This retrospective cohort study was conducted from 10th July 2014 to 9th July 2016 in a tertiary care hospital in the Department of Obstetrics and Gynaecology, BPSGMCW, Khanpurkalan, Sonapat. A dedicated 8 (medical) and 6 (surgical) bedded ICU is present in our hospital. The records of all of these (both antenatal and puerperal) were reviewed. Complications were either obstetric or medical. The data collected included basic demographic data, obstetric and medical history, status before hospital admission, hospital course, ICU course,

treatment taken and the specific interventions done. Maternal demographic characteristics included age, past obstetric history and history of any underlying medical disorder. Complications of either gestational or medical origin were noted. Relevant data regarding obstetric events, indications for ICU transfer/admission, interventions required, length of stay, eventual outcomes were collected, reviewed, tabulated and analyzed.

Table 4: Distribution of cases according to cause of death

Primary cause of death/diagnosis	number
BT reaction-MODS	1
Sepsis	1
PPH	3
Pulmonary embolism with DIC	2
HELLP	1
APH	1
Heart disease	1
Pulmonary oedema	6
PPCM	1

3. Results

The total numbers of deliveries during this period were 4365. Study population consisted of 57 obstetric cases admitted in ICU. The most common obstetric cause for ICU admission in our series was hypertensive disorder of pregnancy (24) followed by hemorrhage. 17 cases of mortality were reported. Mean duration of ICU stay was 2 days (range 1 to 45). Twenty women (10.9%) stayed in the ICU for more than 4 days (Table-3). 30% were in younger age group of 20 to 24 years reflecting ICU care to be more predominant in young people with anemia and premorbid disease conditions. (Table-1).

Most of the cases shifted to ICU had interventions performed before shifting in the form of vaginal deliveries, lower segment caesarean section, or laparotomies. Only 10 patients were shifted undelivered due to non obstetric causes like pulmonary oedema, epilepsy or heart disease.

Pulmonaryoedema was the leading cause of death followed closely by PPH(3 out of 17).

Table 1: Age distribution

Age	No	%age
20-24	25	44
25-29	17	30
30-34	11	19
35-40	3	7

Table 2: Demographic parameters

Characteristics	%
age	18-35 yrs
Mean age	24.12 yrs
Literacy	72.70%
Unbooked	56 (100%)
Mean gravida	2.58

Table 3: Distribution of cases according to stay in icu

Duration of icu stay	
<24 hrs	9
25 to 48 hours	21
49 to 72 hours	6
> 72 hours	20
Total	56

It was observed that hemodynamic and respiratory parameters needing inotropic or ventilator support remains the most common reasons for ICU admissions in our setup and the need for ventilator support indicated a poor outcome. Twenty patients remained in icu for more than 72 hours out of the 56 patients (Table-3).

4. Discussion

Emphasis on early detection of maternal problems and prompt referral to tertiary centers could minimize the prevalence of multiple organ failure and mortality in these women. Our findings highlight the need for establishing a high dependency unit in all such centres in order to avoid unnecessary admission to the intensive care unit and to ensure proper management.

In present study Hypertensive disorders of pregnancy was found in 27.05% cases and obstetric haemorrhage in 31.76% cases which is comparable to studies carried out by Bhat et al , Baloch et al and Devbhaktuni.

Bhat and others found majority of the admissions in the postpartum period and reasons for admission for admission were obstetric hemorrhage ($n = 18, 27.7%$) and pregnancy related hypertension with its complications ($n = 17, 26.2%$). The ICU maternal mortality rate was 30.3%. Mechanical ventilation was used in 41 (73.2%) patients, blood and blood products in 47 (83.9%), and ionotropes in 34 (60.7%).Dialysis was done in 4 patients².

Lataifeh I and others reported preeclampsia (48.8%) and obstetric haemorrhage (37.2%) as most common reasons for icu admissions . The remainder included adult respiratory distress syndrome (6.9%), pulmonary embolism (2.3%) and neurological disorders (4.6%). Mechanical ventilation was required to support 18.6% of patients and transfusion of red

blood cells was needed for 48.8% of patients. There were three maternal deaths (6.9%)³.

Obstetric hemorrhage (26%) and hypertension (21%) were the two most common reasons for admission⁶.

N ashraf outlined maternal mortality as 13%, cause of deaths in his study were due to disseminated intravascular coagulation and multiorgan failure, following an obstetric haemorrhage.

Most were admitted to the ICU postpartum ($n=65, 97%$) and for obstetric problems ($n=58, 87%$), of which postpartum haemorrhage (PPH) was the leading cause ($n=39, 58%$) followed by pre-eclampsictoxaemia (PET) or eclampsia ($n=17, 25%$). The mean duration of ICU stay was 1.8 (SD, 1.2; range, 0.5-10) days; four (6%) of the patients stayed for more than 3 days.

Gupta and others reported obstetric haemorrhage ($n=15, 62.5%$) and haemodynamic instability ($n=20, 83.33%$) to be significant risk factors for ICU admission . Inotropic support was needed in 22 patients (91.66%) while 17 patients (70.83%) required ventilatorysupport.Richa and others advocated Pre-eclampsia (62.0%) and obstetric hemorrhage (18.3%) as the most common reasons for ICU admission in a 12-year-study

Kilpatrick and Mathay suggested a high incidence of acute lung injury (25 percent) that was associated with nonpulmonary or pulmonary infection in 1 eight cases and mortality was 25 percent.

Zwart reported in his study reasons for ICU admission were major obstetric haemorrhage (48.6%), hypertensive disorders of pregnancy (29.3%) and sepsis (8.1%). Assisted ventilation was needed in 34.8%, and inotropic support was required in 8.8% patients¹⁰.

Saha R and Shakya outlined following risk factors in icu admissions as less gestational age, Caesarean section, blood loss and co-morbid conditions of the patient. Mean age was 24.5 ± 4.8 years; average length of stay in ICU was 3.44 ± 3.7 days. Inotropic support was received by six patients (12%), CVP monitoring was done in three patients (6%). Ventilator support was needed in six patients¹¹.

Jain S and others strongly advocate role of high dependency unit to decrease preload to ICU by 5%. Patients with hemorrhagic disorders and that undergoing peripartum hysterectomy need more intensive care¹³.

This high mortality rate in ourstudy could be due to late referral from the peripheral village PHCs , lack of awareness about the disease , delay in transport, and delay in initiation of the treatment. Mortality rate can be reduced by health education, training care-givers to identify high risk cases, training obstetricians in basic emergency care, and early referral to higher centers where multidisciplinary personnel are available.

5. Conclusion

- Availability of good obstetric care is the cornerstone to decreasing maternal mortality.
- Early assessment and intervention of critically ill obstetrical patients and the provision of separate ICU care for them, through a team approach involving obstetricians and anesthesiologists is ideal.
- All residents of obstetrics and gynecology should have short mandatory training phase in critical care.
- Intensive care team must involve the obstetricians to monitor foetal well-being and a close follow up of high risk pregnancy should be instituted in any suspected high risk case.

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