

Profile of Patients Admitted in Maternal Intensive Care Unit at BPKIHS, a Tertiary Hospital in Eastern Nepal

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ABSTRACT

Background: Maternal death is a tragic event. It can be reduced by prompt recognition of critical illness in pregnancy and earlier initiation of intensive care. The physiological changes of pregnancy and the presence of a fetus complicates the assessment and management of critically ill obstetric patients. The objective of this study was to analyse the basic contributing factors for maternal intensive care unit admission and the maternal outcome.

Methods: This was a prospective study conducted in the department of Obstetrics and Gynaecology at B.P. Koirala Institute of Health Sciences, a tertiary hospital in eastern Nepal, for one year duration from January–December 2012. Data like age, diagnosis at admission, intervention, indication for admission, duration of stay and outcome were analysed.

Results: One hundred and ninety two patients were admitted in one year. Among them 177 were obstetrics related admission and 15 were non obstetrics. Out of 177 patients, 21(11.8%) were antenatal, 123(69.4%) were postnatal and 33(18.6%) had early pregnancy complications. The mean age in years was 25.67 ± 7.169 . One hundred and seventy one patients (96.6%) were unbooked and only 6(3.3%) were booked. Among the postnatal patients, 83(67.4%) had delivered at BPKIHS, 24(19.5%) at other health centres and 16 (13%) at home. Antepartum eclampsia was the commonest diagnosis. Out of 192 patients, 148(78.12%) were improved, 24(12.5%) had expired, 15(7.8%) went against medical advice and 5(1.6%) were referred. The median duration of MICU stay in days (IQR) was 2(1-4).

Conclusions: An intensive care unit often offers the opportunity to improve the patient care.

Keywords: intensive care; maternal outcome.

INTRODUCTION

Maternal death is a tragic event, as pregnant women are generally young and healthy patients.¹ One of the indicators of maternal morbidity is “transfer to an ICU.”² WHO describes severe maternal morbidity as near death but survival from complications which occurred during pregnancy, childbirth or within 42 days of termination of pregnancy.^{3,4} The physiological changes of pregnancy, diagnosis specific to the pregnant state and the presence of a fetus complicates

the assessment and management of critically ill obstetric patients.⁵

In Nepal, maternal mortality has decreased from 539/100000 live births in 1998 to 229 in 2008/2009.⁶ Most complications cannot be predicted and therefore occur as emergencies but they can be successfully managed provided women reach functional quality obstetric services in time. Management of such women then becomes multidisciplinary, involving anaesthesiologists, obstetricians, nurses and neonatologists.⁷

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The objective of this study was to analyse the basic contributing factors for MICU admission and the maternal outcome.

METHODS

This study was conducted in the department of Obstetrics and Gynaecology at B.P. Koirala Institute of Health Sciences, a tertiary hospital in eastern Nepal, for one year duration from January - December 2012. It was a prospective study. The study was started after approval from institutional ethical review board. Data of all the patients who got admitted in maternal ICU during the study period were taken. Age, diagnosis at admission, intervention and treatment, indication for admission, duration of stay and outcome were analysed using SPSS version 11.5. Data were presented by percentage, mean and standard deviation. Chi-square test was used to compare proportion difference between two groups. P value <0.05 was considered statistically significant.

RESULTS

One hundred and ninety two patients were admitted in MICU in one year period from January-December 2012. Among them obstetrics related admissions were 177 and 15 were non obstetrical admissions. Out of 177 obstetrics related admission, antenatal with ≥24 weeks period of gestation were 21(11.8%), postnatal 123(69.4%) and 33(18.6%) had early pregnancy complications (<24 weeks). The mean age was 25.67±7.169. The minimum age at admission was 16 years and the maximum age was 58 years. The age distribution is shown in table 1 below. As obstetrics related admission were more, large number of patients were in age 20-34 years.

Table 1. Age distribution of the admitted patients in MICU.

Age (years)	Number (N=192)	Percentage (%)
<20	25	13
20-34	143	74.47
35-50	21	10.93
>50	3	1.5

Majority of the patients, 171 (96.6%) were unbooked and only 6 (3.3%) were booked. Antepartum

eclampsia was the commonest diagnosis at presentation. The other common diagnosis at presentation are shown in table 2 below.

Table 2. Diagnosis of the admitted patients in MICU.

Diagnosis	Number	Percentage (%)
Antepartum eclampsia	34	17.70
Postpartum hemorrhage	21	10.93
Pregnancy with heart disease	20	10.41
Unsafe abortion	16	8.3
Ectopic pregnancy	13	6.7
Pulmonary edema	13	6.7

Among the postnatal admissions, 83(67.4%) had delivered at BPKIHS, 24(19.5%) delivered at other health centres and then were referred and 16 (13%) had delivered at home. Out of 21 antenatal patients, 11 had delivered during hospital stay. Regarding the mode of delivery, 27(20.14%) had elective LSCS, 53(39.55%) had emergency LSCS, 45(33.58%) had spontaneous vaginal delivery and 9(6.71%) had instrumental delivery.

Out of 192 patients, 119 had major surgery and 73 patients did not require any form of surgery. Cesarean section was the commonest major surgery. Co-morbid conditions were found in 27(14.1%) patients. They are listed below in table 3.

Table 3. Co-morbid conditions of the patients in MICU.

Co-morbid conditions	Number of patients (N=27)
Rheumatic heart disease	18
Congenital heart disease	5
Hypothyroidism	1
Guillain Barre Syndrome	1
Chronic hypertension	1
Seizure disorder	1

Table 4. Indications for MICU admission.

Indication	Number of patients (N=192)	Percentage (%)
Observation	92	47.91
Ventilator support	63	32.81
Inotropic support	19	9.89
Respiratory distress	15	7.81
Poor GCS	3	1.56

Central venous pressure monitoring was used in only 10(5.2%) patients. Blood related products were transfused in 107(55.7%) and 85 (44.3%) patients were not transfused at all. The mean number of transfusion was 3.31±1.501. The minimum number of transfused pint was 1 and maximum was 7 pints. Ventilator was required in 65(33.9%) patients and 44 (22.91%) patients required inotropes. The median duration of ventilator in hours (IQR) was 48(17-72). Similarly the median duration of inotropes in hours (IQR) was 48(16-48). The median stay in MICU in days (IQR) was 2(1-4).

The outcome of the patients admitted in MICU is given below in table 5.

Table 5. Outcome of the patients admitted in MICU.

Outcome	Number of patients (N=192)	percentage
Improved	148	78.12%
Expired	24	12.5%
Lama	15	7.8%
Referred	5	1.6%

All the booked patients had improved and were discharged. Among the 171 unbooked patients, 130(76%) had improved and 23(13.45%) patients had expired (p=0.59) as shown in table 6.

Table 6. Relationship of booking status with outcome.

Booking status	outcome				Total (N=177)	P value
	improved	Expired	LAMA	Referred		
Booked	6	0	0	0	6	0.59
Unbooked	130	23	14	4	171	0.59
Total	136	23	14	4	177	

Table 7. Relationship of place of delivery with outcome.

Place of delivery	Outcome				Total (N=134)	P value
	Improved	Expired	LAMA	Referred		
BPKIHS	76	10	5	3	94	0.004
Other Health Centres	21	3	0	0	24	
Home	10	1	5	0	16	
Total	107	14	10	3	134	

Out of 134 delivered patients, 107 had improved and 14 had expired. Regarding the place of

delivery among the improved patients, 76(71%) had delivered at BPKIHS, 21(19.62%) at other health centres and 10(9.34%) patients had delivered at home with p value of 0.004 as mentioned in table 7.

Table 8. Relationship of different variables with outcome.

Variables	Improved (N=148)	P value
Surgery	Performed 107	<0.001
	Not performed 41	
Comorbidities	Present 23	0.62
	Absent 125	
Ventilator	Used 33	<0.001
	Not used 115	
Inotropes	Used 20	<0.001
	Not used 128	
Central Venous pressure monitor	Used 7	0.28
	Not used 141	
Blood transfusion	Required 63	0.02
	Not required 85	

Among the 148 improved patients, 125 did not have any co-morbid conditions (p=0.62). Comparing the use of ventilator with the improved outcome, 115(90.55%) patients were not requiring ventilator and 33 (50.76%) patients required ventilator (p<0.001). Similarly, 20(45.45%) had improved with the use of inotropes and 128(86.48%) had improved without the use of inotropes (p<0.001). Seven out of ten patients where central venous pressure monitoring was used had improved (p=0.28). Blood transfusion also had improved the outcome (p=0.02).

DISCUSSION

Obstetric cases represented 1.43% of the total deliveries in BPKIHS. Despite a series of physiological alteration in pregnancy, most women complete pregnancy uneventfully, but a few of them develop complications that may require ICU admission.

Transfer to the ICU was necessitated by obstetric complications, predominantly hypertension and the related complications, as well as a variety of medical complications. Total number of deliveries in our hospital in the year 2012 was 12372. The ICU utilization rate was comparable to a study from Ilbadan.⁸ This value was high as compare to other studies.⁷ This is in contrast to a South African study where the obstetric admissions were high.⁹

In this study, 96.6% were unbooked and only 3.3% were booked at our hospital. The percentage of booked patients were very less in our study as compared to the other studies.^{7,10} This might be because the booked patients with complications were detected and managed early as well as our hospital is the only tertiary level referral hospital in eastern part of Nepal.

In the present study, obstetric admissions were 92.18% with preponderance of patients admitted after delivery. Postnatal admission was 69.4% of the total obstetric admissions. Preponderance of patients (94%) were admitted after delivery.¹¹ This is similar to the study which revealed 92% of obstetric admissions were in postpartum period.¹² Postpartum admissions were common in other studies as well.¹³⁻¹⁵

In the present study, antepartum eclampsia was the commonest diagnosis followed by postpartum hemorrhage. Antepartum eclampsia and postpartum hemorrhage accounted for 17.70% and 10.93% of total admission in maternal ICU respectively. Obstetric hemorrhage was the commonest obstetric admission diagnosis to their ICU at 30.3%, 26% and 22.2% respectively.^{2, 13, 14} Eclampsia was the most common diagnosis accounting for 66% of all obstetric admissions in a one year review in University of Natal, South Africa.⁹ It was reported that eclampsia accounted for 26.7% of all obstetric admissions¹¹ which was comparable to the admission pattern (22%) from USA.¹⁶

In our study mechanical ventilation was required in 32.81% of the total patients admitted in maternal ICU. It is less in compare to other studies who reported that 60% of the patients received mechanical ventilation.^{11, 17} Similarly, mechanical

ventilation was reported in 41% of the total admissions in ICU.¹⁵

Out of 192 patients in maternal ICU, 24(12.5%) had expired and 15 (7.8%) went against medical advice. Though these 15 patients did not expired while leaving the hospital, but they were in very critical conditions and their status is unknown. Eclampsia was the diagnosis in most of the expired patients as well as in those who left against medical advice. Magnesium Sulphate was the drug of choice. Acute renal failure and intracranial haemorrhage was the most frequently seen complications. Maternal mortality was found to be 11%.¹⁵ But at the same time there was no maternal mortality.⁵ There is a need for co-operation between the obstetrician and the anaesthetist in the management of these high risk patients. The availability of prenatal care may be an important factor in successful outcome in critically ill obstetric patients. With good prenatal care, early detection and timely appropriate intervention might avoid or minimize the effects of such complications.

CONCLUSIONS

Early admission and management of critically ill obstetric patients in the ICU may decrease maternal mortality and morbidity. The need for maternal intensive care should be one of the most important measures considered in the quality of maternal care.

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