

Analysis of clinical characteristics, rationale, and management of critically ill obstetric patients transferred to ICU

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Abstract

Objective: To evaluate the clinical and demographic characteristics, rationale for transfer of critically ill obstetric patients to intensive care unit and their management therein.

Methods: The observational retrospective case series study was conducted at Shaheed Mohtarma Benazir Bhutto Medical University, Larkana, Pakistan, and comprised critically ill female patients transferred to intensive care unit from the department of Obstetrics and Gynaecology between August 2011 and June 2013. The data was collected on pre-designed proforma which included demographic characteristics of patients, their symptomatology and initial diagnosis, intervention in the department, continuing or subsequent complications/reasons for admission to intensive care unit, management and stay there and, finally, outcome. Data was analysed using SPSS 21.

Results: The mean age of 150 patients in the study was 30.3 ± 5.047 years, mean parity was 2.49 ± 2.207 . The most common condition affecting women and leading to their transfer to intensive care was eclampsia/pre-eclampsia in 80 (53.33%) followed by bleeding disorders in 25 (16.65%) and septic shock in 24 (16%). The mean stay in intensive care was 4.47 ± 2.53 days, and 38 (25.3%) patients required ventilator support, while 112 (74.7%) were managed with oxygen and inotropic support. The overall maternal mortality rate was 41 (27.3%), which included 19 (16.9%) patients managed without ventilator, and 22 (57.8%) managed with ventilator ($p < 0.05$).

Conclusion: Hypertensive and bleeding disorders were the main reasons for transfer of obstetric patients to intensive care unit, and maternal mortality was high among patients treated on ventilator support.

Keywords: Critically ill, Obstetric patients, ICU, Outcome. (JPMA 65: 959; 2015)

Introduction

The Millennium Development Goal (MDG) 5A is to reduce maternal mortality rate by three-fourth between 1990 and 2015. In 1990 the estimated global maternal mortality ratio (MMR) was 400 deaths per 100,000 live births, which has come down to 210 (-47%) in 2010, but the progress of individual countries has been variable.¹ Similarly, the estimated MMR in Pakistan was 490 in 1990 which came down to 260 (-46%) in 2010, according to the World Health Organisation (WHO) report of trends in maternal mortality.² The major direct causes of maternal mortality are estimated to be responsible for 75-80% of maternal deaths and result from the complications of pregnancy like eclampsia, high blood pressure (HBP), postpartum haemorrhage (PPH), infection/sepsis, unsafe abortion and prolonged/obstructed labour in addition to indirect and other contributory/social causes.¹ These major direct causes mainly haemorrhage, and hypertensive disorders are also the leading causes of near-miss events.³ Due to these near-miss events, the patients are labelled as critically ill and require intensive care. Transferring these

critically ill patients to Intensive care units (ICUs) is the current practice in all healthcare hospitals where this facility is available. Being situated in a remote area, our tertiary care hospital did not have facility until recently. The current study was planned to review cases to evaluate the clinical and demographic characteristics as well as rationale for transfer of critically ill obstetric patients to ICU.

Patients and Methods

The retrospective study was conducted at Shaheed Mohtarma Benazir Bhutto Medical University, Larkana, Pakistan, and comprised critically ill female patients who had been transferred to ICU from the department of Obstetrics and Gynaecology (Ob/Gyn) between August 27, 2011, and June 28, 2013.

All patients admitted and treated in the department of Ob/Gyn emergency or as elective cases that were either admitted with complications or had developed complications later and transferred to ICU for further management during the study period were included.

Those excluded were patients admitted and treated in the department of Ob/Gyn emergency or as elective cases who developed/did not develop the complications, but were treated in the department and did not require transfer to ICU.

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After permission from the institutional ethics review board, a pre-designed proforma was used to take down data from the record file for each patient, mentioning demographic and other details of history, examination, initial diagnosis, intervention in the department, subsequent complications developed /reason for admission to ICU, treatment and stay in ICU, and the final outcome.

Statistical analysis was done using SPSS 21. Distribution of patients' demographic and clinical characteristics, as well as principal study outcomes, were computed using frequencies and percentages for qualitative variables, and mean \pm standard deviation (SD) for quantitative variables.

Results

The mean age of the 150 patients in the study was 30.3 ± 5.047 years (range: 16-50 years); 63(42%) were 30 years of age. The mean parity was 2.49 ± 2.207 (range: 0-10). Seven (4.6%) patients were primigravida, 60(40%) were para1. Patients of parity 1 were the most affected 90(60%), and that increasing parity was associated with

Table-1: Initial Diagnosis of patients.

Diagnosis	Associated conditions	No: of Patients	Percentage
Eclampsia	PPH(3), HELLP synd(1)	65	43.33
Pre eclampsia	APH (1), PPH (1)	15	10
Primary PPH	Cervical tear (2), DIC (1), Intra-abdominal bleed (1)	13	8.66
Secondary PPH	P sepsis (1)	7	4.66
APH		5	3.33
a) Abruptio (3)			
b) Placenta Previa (2)			
Sepsis	RPOCs (7), IU Collection (6), DIC (1)	18	12
a) Choioamnitis (4)			
b) P Sepsis (14)			
Obstructed labour		2	1.33
Rupture Uterus	DIC (2)	3	2
Perforated Uterus	Int: perforation (1)	5	3.33
Full term pregnancy with	Cardiac problems (4), Intestinal obstruction (1) Cerebral Malaria (1) CLD (1)	7	4.66
Burst abdomen	CLD (1)	3	2
Ectopic Pregnancy		3	2
Ovarian Tumour advanced (2)		4	2.66
Ca endometrium advanced (1)			
Ca cervix advanced (1)			
Total		150	100

PPH: Postpartum haemorrhage

HELLP: Hemolysis, elevated liver enzymes and low platelet count

APH: Antepartum haemorrhage

DIC: Disseminated intravascular coagulopathy

RPOC: Retained products of conception

IU: Intra uterine

CLD: Chronic lung diseases

(*) : Number of patients.

Table-2: Post-management complications/ Reasons for admission to intensive care unit.

Main Complications	Associated complications	No. of Patients	Percentage
Severe Hypertension	Cerebral Oedema (23) Uncontrolled fits (2)	49	32.66
Hypovolemic Shock	Respiratory distress (1) Respiratory distress (5), Pulmonary oedema (3) DIC 5, Renal failure (2)	44	29.33
Septic Shock	Respiratory distress (2), DIC (1)	24	16
Pulmonary Oedema	DIC (1)	12	8
Respiratory Distress	Cerebral edema (2), DIC (1)	11	7.33
Aspiration pneumonia		4	2.66
Cerebral oedema		2	1.33
Cardiac instability		2	1.33
Other:		2	1.33
Cardiogenic shock (1)			
Spinal shock (1)			
Total		150	100

(*) : Number of patients.

Table-3: Comparison of management in SICU with outcome.

ICU Management	Outcome		Total
	Alive	Dead	
1. Non-ventilator supportive treatment	93	19(16.9%)	112
2. Ventilator support	16	22(57.8%)	38
Total	109(72.6%)	41(27.3%)	150

SICU: Surgical intensive care unit.

decreasing number of total complications ($p > 0.05$).

At initial presentation, 93(62%) patients had been admitted with 28-40 weeks of pregnancy; 61(40.6%) with associated symptoms of fits, 32(21.3%) with fever and other symptoms/signs like dyspnoea, HBP etc., whereas 4(2.66%) were less than 28 weeks gravid and presented with fits. Similarly, 19(12.66%) had home delivery and presented with either bleeding per vagina (PV) or foul smelling vaginal discharge and other symptoms. Further, 16(10.66%) had lower segment Caesarean section (LSCS) and presented with burst abdomen, peritonitis and other symptoms. Also, 6(4.0%) had history of hospital delivery and presented with bleeding PV, foul smelling discharge and fits; 5(3.33%) had history of induced labour and presented with symptoms of peritonitis; and 3(2.0%) had amenorrhoea of around one month and presented with lower abdominal pain.

A total of 65(43.33%) patients were diagnosed as suffering from eclampsia, and 15(10%) were in pre-eclampsia, 13(8.66%) had primary PPH, 7(4.66%) had secondary PPH, 5(3.33) had antepartum haemorrhage (APH) and 18(12%)

were in sepsis.

Besides, 70(46%) of full-term patients underwent LSCS whereas 16(10.7%) had spontaneous vaginal delivery (SVD). Among other patients, 23(15.3%) underwent subtotal abdominal hysterectomy and 4(2.7%) total abdominal hysterectomy, 16(10.7%) laparotomy and 4(2.7%) removal of retained products of conception (RPOC) (Table-1).

In terms of post-management complications, 49(32.66%) had severe hypertension (HT) with or without cerebral oedema and other symptoms, 44(29.33) developed hypovolaemic shock, 24(16%) septic shock and 23(15.33%) had pulmonary oedema or respiratory distress (Table-2).

The Mean stay in surgical ICU (SICU) was 4.47 ± 2.53 days (range: 24 hours to 11 days); 113(75.3%) stayed up to 5 days (Table-3).

Among the 112(74.6%) patients managed by non-ventilator support, only 19(16.9%) patients died, whereas 22(57.8%) patients died out of 38(25.3%) patients treated by ventilator support ($p < 0.5$).

Discussion

Majority of the patients admitted to Ob/Gyn setting recover uneventfully, but a few develop life-threatening complications and require intensive care and monitoring either in high dependency unit (HDU) or in ICU. HDU entails more detailed observation or intervention, basic support for a single failing organ system, postoperative care and care of those stepping down from intensive care. Whereas intensive care refers to support for 2 or more organ systems, artificial ventilation, renal replacement therapy and risk of sudden catastrophic deterioration.⁴

The concept of HDU in obstetric care is gaining ample recognition and in settings where the facility of HDU is not available, these patients with life-threatening complications are transferred to ICU care.

In our study 65(43.33%) women were diagnosed as suffering from eclampsia, and 15(10%) as pre-eclampsia. This together constitutes 80(53.33%) women. Similarly in one study,⁵ hypertensive disorders of pregnancy were the main maternal obstetric conditions responsible for 50% cases. In another local study,⁶ the most common indication for admission was hypertensive disorders of pregnancy found in 52%, but in another study,⁷ hypertensive disorders of pregnancy were found in 55(36.2%) patients. Also in studies from Turkey,⁸ Netherlands,⁹ USA,¹⁰ and UK¹¹ it has been shown that the most common acute condition that resulted in transfer to the ICU was eclampsia/pre-eclampsia/hypertensive disorders.

In the present study, 13(8.66%) had primary PPH, 7(4.66%) had secondary PPH, and 5(3.33) had APH, together constituting 25(16.65%) patients suffering from bleeding disorders which was the second most common indication for admission to ICU. This correlates with study from USA¹⁰ in which haemorrhage constituted 16%. Also in studies from Turkey,⁸ UK¹¹ and Lebanon,¹² the obstetric haemorrhage was the second most common indication for admission to ICU. This is also similar to a local study¹³ in which obstetrical haemorrhage was the second most common indication for admission to ICU constituting 18.9%. Another study found it to be the second most common indication⁶ in 22.8%.

In the present study, 18(12%) patients were diagnosed as suffering from sepsis, but 24(16%) were transferred to SICU due to septic shock. This is similar to a study⁶ in which sepsis was 16% and in another study⁵ it was 17%. In other studies, sepsis was 14%, 10% and 13.5% in respect of indications for admission to ICU.^{13,6,14}

The mean stay in ICU was 4.47 ± 2.53 days which is comparable to an earlier study⁷ in which average ICU stay was 4.61 days, and to another¹⁰ in which the mean ICU stay was 3.7 ± 4.6 days. However in one study¹² the mean duration of stay in ICU was 7 ± 5 days.

In ICU, 38(25.3%) patients required ventilator support, whereas 112(74.7%) were managed with oxygen and inotropic support in the present study. This is consistent with a study¹⁵ in which ventilator support was required in 30% patients. In another study¹⁴ ventilation was required in 40.5% and non-ventilator support in 59.4%, while, as in other studies, ventilator support was required in majority of patients.^{5-7,12,15,16} The reason that majority (74.7%) of our patients treated in the ICU were managed without ventilator support is that many of them could have been managed in HDU which was not available in our setting. This is substantiated by a study¹⁷ which stated that specialist obstetric units that provide HDU facilities show lower rates of maternal transfer to critical care units and improved continuity of care before and after labour. The advantages of HDU in an obstetric setting are well defined¹⁸ and include the concurrent availability of expert obstetric care and critical care management, the avoidance of the hazards of emergency transport and improved continuity of antenatal and postnatal care. This is applicable to settings where obstetric facility is at distance from ICU, like our setting where Ob/Gyn setting is away from the main hospital housing the ICU.

Maternal mortality rate in our study was 27.3%, which is comparable to other studies.^{5,12,16} In a study from India,¹⁹ however, it was on lower side at 21.6%, whereas in other

local studies it was bit higher.^{6,14} The reason that overall mortality in the present study was low compared to other studies is that majority 112/150(74.66%) of our patients were managed by non-ventilator support, and among these only 19(16.9%) died, whereas 38/150(25.33%) were managed by ventilator support and 22/38 (57.8%)patients died. Hence, it is apparent from this study that mortality in obstetric ICU patients managed by ventilator support can be fairly high.

Conclusion

Hypertensive and bleeding disorders as well as sepsis were the main reasons for transfer of obstetric patients to ICU. Many of these patients can be managed in HDU obstetric setting, thus preventing transfer to ICU. Besides, Maternal mortality was high among patients treated on ventilator support which needs further evaluation.

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