Original Article

A Stitch in Time Saves Nine: Severe Maternal Morbidity and its Related Maternal Outcome

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Abstract

Objective: To determine causes of severe maternal morbidity and its associated outcome.

Methodology: This is a prospective cross sectional study, conducted at Obstetrics and Gynecology Department, Jinnah hospital Lahore from January 2019- December 2019. A total of 104 subjects in critical condition requiring ICU admission presenting in the antenatal and postpartum period within 42 days after childbirth regardless of gestational age, were selected according to the definition of ICD "Any health condition attributed to and /or aggravated by pregnancy and childbirth has a negative impact on the woman's wellbeing" (International Classification of Diseases).[1] All cases were assessed and provided immediate management and its related outcome was recorded. The data was analyzed SPSS 21.0 and was presented as frequency and percentages.

Results: A total of 104 cases were evaluated. The mean age was 27.11±5.32 years. There were 97(93.3%) cases as unbooked and referred forming the bulk of severe morbidities, as compared to booked cases 7(6.7%), 30 (28.8%) had hypertensive disorders,20 (19.2%) had post-partum hemorrhage cases, 13 (12.5%) had ruptured uterus, Cardiac disease were 10 (9.62%).19 cases(18.3%) needed massive blood transfusion (> 10 pints) Maternal mortality was observed in 26 (25.0%) cases. 72 (78.8%) cases survived with immediate surgical intervention as Emergency LSCS, exploratory laparotomy, hysterectomy.

Conclusion: Hypertensive disorders followed by postpartum hemorrhage and ruptured uterus were the most common causes of severe maternal morbidities. Immediate and quick response and early required intervention in obstetrical emergencies are associated with improved maternal outcome.

Keywords: Hypertensive disorders, Obstetric hemorrhage, severe maternal morbidity.

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Introduction

Emergency obstetric unit is 24/7 receiving critically ill near miss obstetric cases imposing a great challenge to health care provider's team working in tertiary care centers.[2] These obstetrical emergencies are of extreme responsibility of obstetricians to save life of the mother and fetus, if present in antepartum period.

About 2-4/1000 pregnant women are admitted to intensive care unit in developed countries and this incidence is 2-13.5 /1000 deliveries in developing countries.[3] However because of lack of correct data it varies in different countries and women may suffer long-term devastating effects on her physical, mental

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and family health.[4,5] There is a complex interaction between multiple factors which influence the maternal and perinatal outcome so according to WHO strategic plan, #performance of the health system can be improved through equitable & efficient provision of access to, and use of quality skilled care for all women and their newborns with special attention to vulnerable groups and poor class.[6]

Unfortunately, most of the cases in under developed countries are unbooked without any proper antenatal follow-ups & delay in the referrals to tertiary care is the foremost reason for maternal morbidity and mortality. [7]

Despite of all reasons prompt diagnosis, early intervention and multidisciplinary can prevent maternal as well as fetal loss.[8] Very less data is available for such near miss cases and related outcomes, and the current study will help to add in already researched obstetric cases requiring intensive care and monitoring.

Every maternal morbidity case is different in its presentation and with each single diagnosis patient's presentation could be different resulting varying degree of survival. So the most important step to treating such cases is better understanding and evaluation of each case and proper updated knowledge of behavior of disease process timely intervention where it is required.

Maternal death and long term morbidities have very long-term distressing effects on the whole family and even for the country as each maternal death counts, for this reason, this study aims to evaluate the maternal outcome in critical cases with severe obstetric emergencies and to improve the management plans for a better outcome in these cases and ultimately reducing maternal deaths. Timely access to medical care is considered as lifesaving but the data on outcome and factors associated with health care decision making during obstetric is lacking, this study would help to describe the outcome of severe maternal morbidities among women presenting to a tertiary health facility.

Methodology

A prospective, cross sectional study was conducted at Jinnah hospital Lahore. A total of 104 pregnant women were selected by non-probability consecutive sampling, who presented in an emergency obstetric unit in critical condition, requiring ICU admission for obstetric & non obstetric reason irrespective of gestational age in antenatal and postpartum period within 42 days of delivery according to ICD definition of severe maternal morbidity.[1] Women who are received dead with these obstetric emergencies were excluded from the study. Demographic data, obstetric history, booking status and condition at arrival were recorded, After the clinical history, detailed examination and all necessary investigations, immediate medical and surgical intervention were given, as and when needed and the maternal outcome was noted on a pre-designed proforma. Data was entered and analyzed on SPSS version 21.0. Frequencies and percentages were calculated for qualitative variables and mean and standard deviation were calculated for quantitative variables. Socio-demographic and obstetric variables were cross tabulated with the maternal outcome. Chi-square test was used to assess statistical significance and p-value<0.05 was considered significant.

Results

Total no of obstetrical emergencies were104 which were enrolled in the study, the major bulk of cases was unbooked 97 (93.3%), and only 7 (6.7%) were booked.29 cases were referred and 75 cases were presented directly to emergency, referred cases were those who opted for hospital delivery anywhere and those who presented directly were either delivered at home by TBAs or never had any hospital visits. Booking status is very important in these acute obstetrical emergencies, as in our study mostly un-booked cases developed critical condition (p-value 0.007) which is statistically significant. Most of 62(59.6%) the cases were in age group of 25-35 years.39 (37.5%) cases were below 25 years. Most of the women were in their first pregnancy 37(35.6%)). The commonest presentation in acute severe morbidity was shocked 40.4 %(p-value 0.004), followed by generalized tonic clonic fits due to hypertensive disorders (26%). (Table I)

Hypertensive disorders (28.8%) were the most common diagnosis among these subjects followed by post-partum hemorrhage (19.23%). Previously scarred uterus with history of trial of labor presented with a diagnosis of Ruptured uterus in n=13 cases. Among indirect causes or non-obstetrical causes cardiac disease n=10, viral hepatitis n=12 and respiratory diseases n=3 were noted. In summers there were many cases of acute viral hepatitis A &E, in pregnancy hepatitis E is very hazardous and 12 (11.54%) cases were reported in our study (Figure 1).

Table No I: Demographic and Obstetrics Profile of Subjects (n = 104)	
Variables	**n (%)**
Age Mean = 27.115 SD = 5.32 Min = 18 years Max = 44 years	
< 25 years	39(37.5)
25 - 35 years	62(59.6)
35 - 45 years	3(2.9)
Parity	
Primigravida	37(35.6)
P1 - P3	24(23.1)
P4 - P5	25(24.0)
P > 5	18(17.3)
Booking Status	
Booked	7(6.7)
Un booked	97(93.3)
Referral Status	
Yes	29(27.9)
No	75(72.1)
Condition at arrival	
Shock	42(40.4)
Irritable & drowsy	14(13.5)
Shortness of breath	15(14.4)
Cyanosed	3(2.9)
Fits	27(26.0)
Acute abdomen	3(2.9)
Presentation at gestation	
Antepartum	75(72.1)
Postpartum	29(27.9)

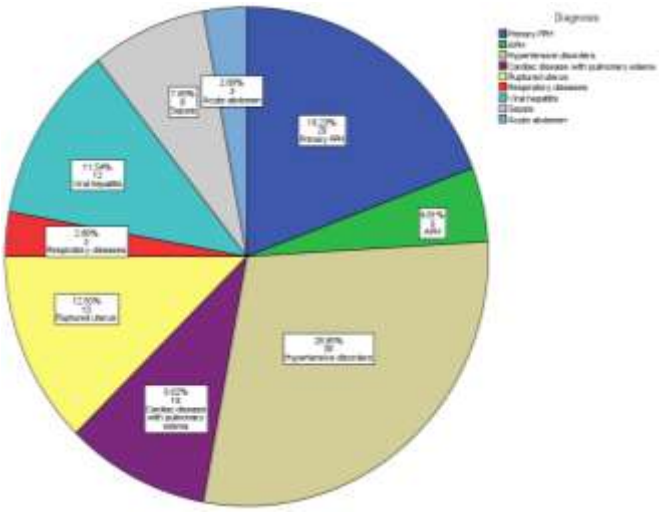

Figure 1. Diagnosis among Subjects

The irreversible hypovolemic shock was the cause of maternal death in 12 cases, 8 deaths were noted due to eclampsia and its complications and the remaining 6 deaths were due other non-obstetrical causes. 74% cases were given < 10 blood transfusions ad 19 cases needed massive transfusions (Table II). 36(34.6%) patients had a hospital stay of 5-10 days and 39(37.5%) cases had a prolonged hospital stay of > 10days. (p-value 0.000). (Table III).

Table No II: Maternal Outcome among Subjects (n = 104)	
Variables	**n (%)**
Intervention done	
SVD	13(12.5)
Emergency LSCS	42(40.4)
EX Laparotomy	23(22.1)
EUA & proceed	6(5.8)
Obstetrical hysterectomy	17(16.3)
Assisted ventilation & medical treatment	3(2.9)
Blood transfusion	
Nil	27(26.0)
< 5 pints	33(31.7)
5 - 10 pints	25(24.0)
> 10 pints (Massive blood transfusion)	19(18.3)
Maternal Outcome	
Survived and Discharged	70(67.3)
Expired	26(25.0)
Survived with long term morbidity and organ dysfunction	8(7.7)
Hospital stay	
< 5 days	29(27.9)
5 - 10 days	36(34.6)
> 10 days	39(37.5)

Out of 104 patients who presented with severe morbidity 78(75.0%) patients survived due to timely intervention and 26 maternal deaths were noted, and the leading factor for loss of these lives was the condition of patient at arrival (p-0.004) and protagonist attitude of attendants (Table III)

70 cases survived and discharged in satisfactory condition, 26 (25.5%) maternal deaths were noted despite all measures because of their critical condition at presentation and 8 (7.6%) cases were survived but developed long term complications and organ dysfunction as acute kidney injury and Cerebrovascular accidents. The emergency section was performed in 42(40.38%) cases, emergency laparotomy done in 23 and peripartum hysterectomy performed in 17 cases due to uncontrolled hemorrhage.

Discussion

Severe maternal morbidity is gaining special interest internationally as a new quality care indicator following maternal mortality rate and ratio. Severe maternal morbidity describes a woman with organ dysfunction which if not treated properly can result in maternal death OR a lethal condition in pregnancy, labor and

puerperium in which a woman survives by immediate medical care or by chance.

Hypertensive disorders Eclampsia and pre-eclampsia 30 (28.8%) and postpartum hemorrhage 20 (19.23%) were the two leading causes of obstetrical emergencies observed in his study, which is very much consistent with the results of saha & Gautam and Lale S.[9,10 11]

Correction of anemia in antenatal period and early control of blood pressure can prevent these complications.

Un-booked cases were more likely to die as compared to booked cases. Out of 26 maternal deaths 21 were unbooked (80.8%), and Yego study showed the same results. [12, 13]

The majority of cases were of age group of 25-35 yrs, 47% were multigravida, 35% were primi gravidas and 10% were grand multiparas similar to local study by Qureshi R etal.[14, 15]

Age, comorbidities, condition at arrival, booking status and referrals were the major factors affecting obstetric deaths**.** Many underutilized modalities to reduce

Table No III: Maternal Outcome and Independent Variables

Variables n=104		Maternal Outcome			P value
		Survived & Discharged	Expired	Survived with long term morbidity	
		n (%)	n (%)	n (%)	
Age	> 25 years	32 (45.7%)	6(23.1%)	1(12.5%)	.065
	25 - 35 years	37(52.9%)	18(69.2%)	7(87.5%)	
	35 - 45 years	1 (1.4%)	2(7.7%)	0(0.0%)	
Booking Status	Booked	1 (1.4%)	5(19.2%)	1(12.5%)	.007*
	Un-booked	69(98.6%)	21(80.8%)	7(87.5%	
Referral Status	Yes	23(32.9%)	3(11.5%)	3(37.5%)	.096
	No	47(67.1%)	23(88.5%)	5(62.5%)	
Parity	Primigravida	28(40.0%)	8(30.8%)	1(12.5%)	.186
	P1 - P3	12(17.1%)	10(38.5%)	2(25.0%	
	P4 - P5	17(24.3%)	4(15.4%)	4(50.0%)	
	P > 5	13(18.6%)	4(15.4%)	1(12.5%)	
Condition at arrival	Shock	27(38.6%)	12(46.2%)	3(37.5%)	.004*
	Irritable & drowsy	12(17.1%)	0(0.0%)	2(25.0%)	
	Shortness of breath	8(11.4%)	6(23.1%)	1(12.5%)	
	Cyanosed	2(2.9%)	1(3.8%)	0(0.0%)	
	Fits	21(30.0%)	6(23.1%)	0(0.0%)	
	Acute abdomen	0(0.0%)	1(3.8%)	2(25.0%	
Presentation at gestation	Antepartum	54(77.1%)	16(61.5%)	5(62.5%	.260
	Postpartum	16(22.9%)	10(38.5%)	3(37.5%	
Intervention done	SVD	9(12.9%)	2(7.7%)	2(25.0%)	.030
	Em. LSCS	33(47.1%)	9(34.6%)	0(0.0%)	
	EX Laparotomy	14(20.0%	5(19.2%)	4(50.0%)	
	EUA & proceed	6(8.6%)	0(0.0%)	0(0.0%)	
	Obst.hystrectomy	7(10.0%	8(30.8%	2(25.0%)	
	Assisted ventilation & medical treatment	1(1.4%)	2(7.7%)	0(0.0%)	
Blood transfusion	Nil	20(28.6%)	7(26.9%)	0(0.0%)	.290
	< 5 pints	23(32.9%)	8(30.8%)	2(25.0%)	
	5 - 10 pints	17(24.3%)	4(15.4%)	4(50.0%)	
	> 10 pints (Massive blood transfusion)	10(14.3%)	7(26.9%)	2(25.0%)	
Hospital stay	< 5 days	11(15.7%)	18(69.2%)	0(0.0%)	.000*
	5 - 10 days	29(41.4%)	5(19.2%)	2(25.0%)	
	> 10 days	30(42.9%)	3(11.5%)	6(75.0%)	
Diagnosis	Obstetrics causes	46(65.7%)	19(73.1%)	3(37.5%)	
	Non Obstetrics causes	24(34.3%)	7(26.9%)	5(62.5%)	.180

maternal death like use of oxytocic and AMTSL for PPH control and use MgSO4 for Eclampsia before referrals can also reduce the number of dying mothers.[16,17,18] As ours is a tertiary care hospital receiving many referrals from the periphery which is lacking blood transfusion facilities and availability of trained health care workers at primary health care centers so at arrival the patient is already in irreversible shock and despite immediate emergency measures they don't survive. So proper antenatal booking of high risk cases and early identification and anticipation of complications can reduce maternal morbidity and mortality. Furthermore, the availability of trained staff and blood bank should be established at low resource settings to provide at least initial resuscitative measures before referring such critical patients.

Acute viral hepatitis A and E with increased maternal morbidity and mortality was observed in 12 cases in summer and our results are similar to Hamid SS et al. [19,20,21]In summers outbreaks of acute viral hepatitis mainly A and E in pregnancy is reported with associated complications of coagulopathy and muti-organ failure. . Viral hepatitis must be taken seriously in pregnancy and guidelines should be followed.

27 cases had no blood transfusion given as they were not having blood loss but other causes emergencies.19 cases required massive transfusion of blood and its products, many of these cases were in state of severe hypovolemic shock due to ruptured uterus and post-partum hemorrhage. Complications related to massive transfusion were noted in some cases, on the other hand, availability of blood transfusion immediately is a very important factor in saving maternal lives as mostly the maternal death were those who presented in irreversible hypovolemic shock with negative blood groups, and with restricted availability sometimes and we lost lives. The role of attendants is also very important in this aspect because most of the attendants were found reluctant in arranging blood as they took patients from far areas and were also having no links in far off city.[22, 23]

Exploratory laparotomy was done in 23 cases of patients presented with PPH, concealed hemorrhage and acute abdomen, B- Lynch suture and stepwise revascularization done. Obstetrical hysterectomy was done in 17 cases as a last resort.

Most of the 70 (67.3%) cases were survived and discharged without any long-term morbidity, after providing timely management, because of 24/7 availability of trained staff, following all steps of dealing with such emergencies with local protocols.[24] Maternal Mortality was observed in 26 cases and 8 cases survived with long-term organ dysfunction despite providing lifesaving emergency measures, because these women were already in an irreversible state of shock, and in some referred cases primary and secondary delays was observed.

In most of the cases 39 out of 104 required longer hospital stay more than 10 days in high dependency care for recovery to deal with associated complications similar to the study done by Lazariu V [25] showing the extended length of hospital stay with SMM.

Emphasis should be given to find out all principal factors contributing to these SMM cases and must be addressed beforehand. Repetitive obstetric drills must be arranged to deal with such grave emergencies by medical staff dealing with specially on-call residents. Teamwork and standard unit protocols should be followed for management plans of these obstetric cases

Conclusion

Hypertensive disorders were the major complication of these morbidities followed by obstetrical hemorrhage. Majority of women survived by prompt diagnosis and early intervention. Almost all patients were unbooked without any antenatal, so early booking and detection of risk factors can save maternal life so, primary and secondary health care services should be improved. The survival of critically ill patients is highly dependent on the condition of the patient at arrival.

Limitation: This study is reflects results from a single institute. A multicenter study should be done to assess the outcome of these critical cases.

Recommendations: Despite all efforts some obstetric emergencies do occur, so by promoting antenatal care at the national level, institutional deliveries of high-risk cases, SBAs at delivery these complications can be minimized. The best outcome can be achieved by liberal blood transfusion services and regular obstetric drills at primary and secondary health services also. Health education to pregnant women about the importance of antenatal care, picking up high risk cases and early referrals are required

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