

Critical Care in Obstetrics – A 3 year Review in a Tertiary Referral Hospital

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OBJECTIVE – To review the primary factors for admission and maternal outcome in obstetric cases requiring admission in intensive care unit for critical care. **METHOD** – One hundred and eight obstetric cases admitted in various intensive care units (ICU) in our tertiary referral hospital, over a period of 3 years were reviewed. Primary factors for admission and the maternal outcome were analysed. **RESULTS** – Ninety-four percent of total obstetric admissions to ICU were emergency referral and 93% of the deaths occurred in this group. Hypertension, sepsis and hemorrhage accounted for 59% of admissions and resulted in 53% of deaths. Maternal medical disorders were responsible for 27% of admissions and deaths of which anemia was an important factor; 63% recovered with intensive care while 27% expired and 10% went home against medical advice.. **CONCLUSION** – Maternal mortality can be greatly reduced by prevention of complications during pregnancy. But when they do occur, treatment in a well equipped ICU improves maternal survival, reducing the mortality significantly.

Key words : intensive care, maternal, morbidity, preventable mortality

Introduction

Maternal mortality continues to be high in India and other developing countries. A high maternal mortality rate not only reflects inadequacy of health services, but also a low standard of living and socioeconomic status. Poor antenatal care, deliveries by untrained birth attendants, unsafe abortions, inadequate services, late referrals, lack of skilled staff at the peripheral hospitals and social factors like poverty and illiteracy lead to various life threatening complications, necessitating intensive care. Management of such patients in a well-equipped intensive care unit (ICU) improves maternal survival, reducing the mortality to a considerable extent. The primary factors for admission and maternal outcome in obstetric cases admitted in ICU for critical care are reviewed here.

Material and Methods

One hundred and eight obstetric cases admitted in various ICUs over a period of 3 years from January 2000 to December 2002 were reviewed and the primary factors for admission and the maternal outcome were analysed. Ours is a tertiary referral center and receives referrals from the local and peripheral, government and private hospitals.

Investigations conducted included complete hemogram, blood grouping and typing, blood sugar, serology for syphilis, retrovirus and hepatitis B, routine urine examination and sonography. Renal function tests (RFT), liver function tests (LFT), coagulation profile, LDH levels and fundoscopy were done in all cases of severe PIH. Viral markers, smear for malaria parasites and serum electrolytes were done in addition to these in cases of jaundice. Vaginal and cervical swabs, urine and blood cultures were done in cases of sepsis. Chest x-ray, arterial blood gas estimation, CT scan, lumbar puncture and other specific investigation were done when indicated.

Results

Incidence of obstetric admissions to ICU was 1.5% (108 / 6318) of total obstetric admissions over the study period. Of the 108 women admitted in ICU, 102 (94%) were emergency referrals and the rest were booked with us. Fortyseven percent were referred antepartum, 40% postpartum, 9% intrapartum. Two cases were referred after voluntary termination of pregnancy under the MTP Act, 1971, one after molar pregnancy and one was having ectopic pregnancy.

Mean maternal age was 24 years and mean gestational age in those admitted before delivery was 34 weeks excluding four cases that were referred between 10 and 20 weeks of gestation. There were almost an equal number of primiparas (48%) and multiparas (52%). It is important to note that, of those delivered outside, 20% had home delivery conducted by untrained birth attendants. Primary factors for admission in ICU are shown in Table I.

Direct obstetric factors were responsible for 68% of

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admissions. Hypertension, sepsis and hemorrhage together accounted for 57% of admissions. Other direct causes such as acute fatty liver of pregnancy, pulmonary embolism, gestational trophoblastic disease and postpartum hemolytic uremic syndrome were responsible for 10%. Though severe anemia accounted for 9% of admissions, mild to moderate anemia was an associated and aggravating factor in 61% of women. Other medical disorders such as viral hepatitis, cardiac disease, malaria, tuberculosis, idiopathic thrombocytopenic purpura, diabetes, SLE, hyperthyroidism and Guillian Barea syndrome were responsible for 19% of admissions. The remaining 3% were due to unrelated causes – one case of accidental burns and two cases of acute myeloid leukemia.

A significant number of women had associated acute organ dysfunction (Table II) and required specialized treatment procedures such as assisted ventilation, dialysis and multiple transfusions of blood and blood products and surgical interventions (Table III).

Table I - Primary Factors for Admission to ICU

Factor for admission	No (%)
Hypertension	33 (30%)
Sepsis	18 (16%)
Hemorrhage	12 (11%)
Other direct causes*	11 (10%)
Severe anemia	10 (9%)
Other medical disorders**	21 (19%)
Unrelated	3 (3%)
Total	108 (100%)

* Acute fatty liver of pregnancy, pulmonary embolism, gestational trophoblastic disease, post-partum hemolytic uremic syndrome.

** Viral hepatitis, cardiac disease, malaria, TB, diabetes, idiopathic thrombolytic purpura, SLE, hypertension

Table II – Acute Organ Dysfunctions Present in Women admitted to ICU

Organ Dysfunction	No. (%)
Respiratory	46 (42%)
Hepatic	36 (33%)
Renal	35 (32%)
Coagulatory	48 (44%)
Cardiovascular	16 (14%)
Neurological	13 (12%)
Multiorgan	37 (34%)

Twelve women required laparotomy, of which three needed cesarean hysterectomy for uterine rupture two for post-LSCS sepsis, two for post-MTP (voluntary termination of pregnancy) sepsis and one for ruptured ectopic gestation. Amongst these 12 cases, hysterectomy was required in three – in two for ruptured uterus and in one for puerperal sepsis following home delivery by untrained birth attendants and this case required resection of the gangrenous bowel. Rest of the cases of sepsis require drainage of pus and peritoneal lavage. Other surgical procedures required included evacuation for retained products of conception, vulval and abdominal wall hemaoma drainage, resuturing of spisiotomy and abdominal wound, and tracheostomy.

Intensive care helped in recovery in 63% of patients, 27% expired, while the remaining 10% were discharged against medical advice.

The primary causes of death are shown in Table IV; 93% of deaths occurred in the emergency referrals.

Table III – Treatment Required in ICU

Procedure	No (%)
Assisted ventilation	46 (42%)
Dialysis	22(20%)
Whole blood / packed cells transfusion	56 (51%)
Fresh frozen plasma transfusion	50 (46%)
Platelets transfusion	33 (30%)
Cryoprecipitate	2 (2%)
Surgical intervention	25 (23%)

Table IV- Primary Causes of Maternal Deaths

Cause of Death	No (%)
Hypertension	6 (20%)
Sepsis	7 (23%)
Hemorrhage	3 (10%)
Severe anemia	3 (10%)
Other direct causes	3 (10%)
Other medical disorders	5 (17%)
Unrelated	3 (10%)
Total	30 (100%)

Discussion

At the end of the analysis, it is evident that most of the cases requiring admission in ICU were emergency referrals (94%) and 93% of deaths occurred in this group. Hypertension, sepsis and hemorrhage were the initiating obstetric events in 59% of cases and resulted in 53% of deaths. Medical disorders in pregnancy were responsible for 27% of admissions and 27% of deaths in ICU and anemia was an important contributor.

Table V shows the other studies analysing the risk factors for admission to ICU and Table VI gives maternal deaths, both in comparison to our study. The number of women admitted with hemorrhage as risk factor were comparatively less in our study. This was probably due to the fact that hemorrhage being an acute emergency and there being a lack of an efficient referral system, for every woman who reached our hospital, there would have been many others who could not have reached.

Table V : Comparison With Other Studies Analysing the Risk Factors for Admission to ICU

Study	Hypertension	Sepsis	Hemorrhage	Medical disorders
Baskett and Sternadel ¹	25%	15%	22%	29%
Mantel et al ²	26%	20%	26%	17%
Our study	33%	17%	11%	27%

Table VI : Comparison of Important Direct Causes of Maternal Death with Other Studies

Study	Hypertension	Sepsis	Hemorrhage
Wagaarchi et al ³	24%	26%	20%
Mantel et al ²	33.7%	27%	10%
Our study	20%	23%	10%

Maternal morbidity was much more than mortality. Though morbidity could not be measured as accurately as mortality, presence of organ system dysfunction/failure, requirement of assisted ventilation, dialysis, multiple transfusions of blood and blood products and surgical interventions are all indicators of severe maternal morbidity.

Severe acute maternal morbidity may be defined as *near miss* which describes a patient with acute organ dysfunction, which if not treated can result in death². It is in these cases that intensive care helps in recovery.

Most of these complications and deaths are preventable⁴. Essential antenatal care at domiciliary and peripheral levels can prevent most of the complications of PIH and anemia by early detection and treatment. Presence of skilled health care staff and trained birth attendants at deliveries results in clean deliveries and also early referral in case of complications, reducing sepsis and obstructed labor and their consequences, more so because most of the deliveries in rural India occur at home. Abortion related deaths could be prevented by better contraceptive access and provision for safe abortions. These, along with an efficient referral system and integrated domiciliary, rural and institutional services can prevent most of the maternal deaths.

General health measures such as provision of safe drinking water, environmental sanitation, health education etc. could prevent or decrease the incidence of most of the maternal diseases, thereby reducing the mortality. Equally

important is the role of social and cultural factors, socio-economic development of the community and active community participation.

But unfortunately in India, health services are poorly organised and even now, 50% of women do not get any antenatal care and two thirds of deliveries are not supervised by skilled attendants⁵. Contraceptive usage is 45% and female literacy rate is 38%. Till these are improved, complications are bound to occur. Treatment of such complications in a well-equipped intensive care unit, with excellent facilities and a coordinated team approach by the various specialities involved in the management, can save many lives thereby reducing the mortality to a significant extent.

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