

Trauma in Pregnancy - A 5-year Prospective Analysis of Feto-maternal Outcome in Tertiary Centers

Biswas Subhash Ch.¹, Mukhopadhyay Cauiam', Kundu Debobraiu', Mukhopadhyay Mrityunjoy³, Sen Sipra', Biswas Bistoanath''

Departments of ¹Gynecology and Obstetrics and ²Surgery, North Bengal Medical College, Darieling, West Bengal, and Departments of ³Surgery of ⁴Pathology, and ⁵Anesthesiology Calcutta National Medical College.

OBJECTIVE - To evaluate the clinical profiles, and maternal and perinatal outcomes in women who sustained significant trauma during pregnancy. **METHODS** - A total of 27 pregnant women were hospitalized with significant trauma over a span of 5 years (1999-2003). They were prospectively analyzed in respect of nature of injury, various complications arising out of it, and maternal and perinatal outcomes. **RESULTS** - Burns remained the commonest type (48.14%) of injury, followed by physical assault and abuse (11.11%). Motor vehicle accident was less common (7.40%). Spontaneous abortion (22.22%), preterm labor (44.44%) and abruptio placentae (7.4%) were notable complications. Maternal mortality was 25.92%. Fetal and perinatal loss together was 59.25%. **CONCLUSION** - Trauma in pregnancy is not an insignificant contributory factor to maternal, fetal and perinatal loss. In reducing the maternal and perinatal mortality and morbidity a multidisciplinary team approach plays the pivotal role.

Key words : pregnancy, trauma in pregnancy

Introduction

Trauma is the leading non-obstetrical cause of maternal death'. Although maternal mortality due to hemorrhage, infection, hypertension and neglected obstetric care is still very high in our country, the number of maternal deaths due to trauma is also steadily rising. Accidental injuries occur in 6-7% of all pregnant women". Gait instability due to altered centre of gravity caused by enlarged uterus combined with laxity of pelvic ligaments makes them particularly susceptible to injury by fall. Fetal loss is also very high ranging between 40 and 70 %2. As the fetal death is the consequence of maternal death, the main guideline for managing pregnant patients sustaining trauma is ensuring maternal survival. It requires a prompt and skilled team approach with the knowledge of altered anatomical and physiological changes of pregnancy. The purpose of the present study was to assess the magnitude of the problem and the consequent feto-maternal outcome.

Material and Methods

A prospective analysis of women who sustained any significant trauma in pregnancy like blunt trauma, fall, physical assault, burn, motor vehicle accident (MVA)

and penetrating injuries was made during a 5 year period from July 1999 to June 2003. These women were either admitted in the department of Gynecology and Obstetrics or were attended to as referred cases in other departments like surgery or orthopedics, or in intensive care units. Demographic data, information relating to gestational age, details regarding the mechanism, and the type and the severity of injury were studied and analysed. The women were managed by a team of experts including surgeon, orthopedician, anesthetist, physician and obstetrician according to the nature and severity of injury. Necessary investigations including Kleihauer-Betke (KB) test and radiological imaging, when indicated, were carried out to assess the maternal and fetal health and timely intervention was performed as required. Recovered women carrying the pregnancy were followed till delivery. The maternal, fetal and perinatal outcome were analysed.

Results

Twenty-seven pregnant women sustained different types of trauma, burns being the most common (48.14%). Table I shows the demographic profile in relation to the type of injury. Only two women were admitted with motor vehicle accident with severe intra-peritoneal (IP) hemorrhage and multiple abdominal organ injury. The mean gestational age at the time of trauma was 27.85 ± 8.36 weeks ranging from 8 to 39 weeks. It was observed that blunt trauma like fall was mainly found during the third trimester of pregnancy whereas burns or MVA were noted at any gestational age. Physical abuses and burns were

Paper received on 06/11/03 ; accepted on 07/07/04

Correspondence :

Dr. Subhash Chandra Biswas

Happy Nook, ECTP Phase IV, Flat No. A-10! A,
East Kolkata, Kolkata - 700 107.

Tel. 033 24423003 Email : subh_ranu@vsnl.net

Table I. Demographic Profile

Nature of trauma	Age (Years)	Period of gestation (Weeks)	Gravidity	Parity	No.	%
Blunt trauma and fall	25.16 ± 7.70	33 ± 5.01	1.8 (1-3)	1.0 (1-3)	6	22.22
Physical assault and abuse	22.34 ± 3.21	34.3 ± 4.5	1.6(1-3)	0.6(0-2)	3	11.11
Motor vehicle accident	21 ± 1.41	21 ± 7.1	1.0	0	2	7.10
Head injury	18	24	1.0	0	1	3.70
Penetrating injury	25 ± 4.24	32 ± 2.8	2.5 (1-4)	1.5 (0-3)	2	7.40
Burns	21.54 ± 2.4	24.7 ± 9.28	1.69 (1-4)	0.5 (0-2)	13	48.14
Total	22.7 ± 4.52	27.85 ± 8.36	1.7 (1-4)	0.6 (0-3)	27	100

Table II : Complications Related to Trauma

Complications	Number (n=27)	Percent
Intrauterine fetal death	2	7.40%
Preterm labor	12	7.40%
Premature rupture of membranes	5	18.5%
APH - genital injury	1	3.70%
Abruptio placentae	2	7.40%
Postpartum hemorrhage	4	14.8%
Intraperitoneal hemorrhage with organ injury	2	7.40%
Fetomaternal hemorrhage	4	28.57% (4 out of 14 cases excluding burns)

Few women had more than one complication

Table III. Maternal and Perinatal outcome

Perinatal outcome	No.	percent	Maternal Outcome.	No.	Percent
Abortion	6	22.22	Complete recovery	14	51.85
Stillbirth	2	7.40	Recovery with morbidity	6	22.22
Livebirth	19	70.37	Maternal Death	7	25.92
Full term	7		Motor vehicle accident	2	
Preterm	12		Burn	5	
Neonatal death	8/19				
Full term	1/7				
Preterm	7/12				

found mainly in the primi-gravidas (56% of all the subjects) and that too in younger age group (18-23 years).

Various complications related to pregnancy resulting from trauma are analyzed in Table II.

While evaluating feto-maternal outcome (Table III), it was noted that six (22.22%) pregnancies were wasted in the form of spontaneous abortion; majority (83.33%) of them (5 out of 6) had burn injury. Feto-maternal hemorrhage was detected in 4 out of 14 (28.57%) trauma victims (excluding burn cases). Twelve mothers (44.44%) had preterm delivery; 50% of them had burn injury. Out of 21 total births, 10 (47.60%) babies were lost - 2 still births and 8 early neonatal deaths. Out of a total of 27 pregnancies only 11 (40.74%) babies survived beyond neonatal period. Overall fetal and perinatal wastage in this study was 59.25% (16 out of 27). Maternal mortality (7 out of 27) was very high (25.92%). Five women died due to burn injury and two from MYA. Nearly half of the mothers (51.85%) recovered completely without any morbidity (Table III).

Discussion

Although trauma is the most frequent cause of maternal mortality in USA², it also contributes to significant maternal and fetal mortality and morbidity in our country. True incidence of different modes of trauma in pregnancy is not known in developing countries. A study by Connolly *et al*³ showed that a majority of injuries resulted from MVA (54.6%) followed by physical assault and abuse (22.3%), fall (21.8%), and burn with other minor trauma (1.3%). A study by Pearlman *et al*⁴ showed that a majority of injuries resulted from MVA (60%) followed by fall (25.9%) and direct blow to the abdomen (14.1%). In contrast, burns remains the leading cause (48.14%) in our series; MVA being less common (7.4%).

Pregnant women sustaining burn injuries were of a relatively younger age (18-23 years) and majority were primi-gravidas (6 out of 13). Out of 13 burn cases, three were accidental. But the remaining 10 may possibly be linked to social maladjustment in marital relationship leading to attempted suicide or homicide. The mean gestational age at the time of trauma was 27.85 ± 8.36 weeks and that at delivery 34.9 ± 2.96 weeks as compared to 25.9 weeks and 37.9 weeks respectively in the study by Connolly *et al*³. Falls were most commonly found during late third trimester (32-36 weeks). Probably a change of centre of gravity due to enlarged uterus and pelvic ligamentous laxity make them more prone to slip and fall. Domestic abuse was found in only three cases, out of which two developed placental abruption. This relative low incidence as compared to that reported by Poole *et al*⁵ (31.5%) is because of the prevalence of

voluntary non-disclosure of this problem in our society. Many women who claimed to have fallen may have been the victims of physical assault in the present study. Feto-maternal hemorrhage noted (28.51%) in this series is in concordance with the reported incidence of up to 30.6% of trauma victims in the literature⁶. Unlike in developed countries, we encountered only two cases of MVA with fatal consequences to the mother and the fetus. In the review of literature⁷ it was observed that trauma was the leading (22% to 46.3%) cause of maternal death and the prognosis for both the mother and the fetus was poor when the injury was burn extending more than 50% of surface area. This is in congruence with the results observed in our study, the maternal mortality being similar (25.92%) and burn injury being the leading (5 out of 7) cause of maternal death. In fatal cases it involved more than 60% of surface area.

Fetal outcome depends not only on the gestational age at the time of trauma but also on the type and the severity of trauma and the extent of alteration of feto-maternal physiology. Fetal mortality in the literature ranges from 40% to 70%². In our series, only 11 out of 27 mothers were fortunate to leave the hospital with their babies while the remaining 16 lost their pregnancies in the form of spontaneous abortion, prematurity and early neonatal death. In our series, fetal loss was 59.25% which compares well with that reported by Bobrowski⁸. With maternal survival, the most common cause of fetal death is placental abruption (5.9%)⁴; but we had only two such cases in the present study. Hobel *et al*⁹ have stressed the importance of thigh length support stockings as a precautionary measure in MVA cases. Preterm labor is a common (44.44%) sequel of maternal trauma in our series (12 out of 27) as also in the series of Pearlman *et al* (41%). Prematurity was the leading cause of neonatal mortality (7 out of 21 total births or 33.33%) in this study (Table III). Out of eight neonatal deaths, seven were due to complications of prematurity.

Trauma during pregnancy contributes significantly to maternal and perinatal mortality and morbidity. Burn remains the major and the most serious type of insult during pregnancy, which contributes maximally as far as the maternal and fetal loss is concerned. Physical assault and abuse should not be underestimated, as many women try to hide the history because of social reasons. Managing pregnant women with trauma should be a well coordinated, multidisciplinary approach by skilled personnel having knowledge of anatomical and physiological changes during pregnancy. The guiding principle should be that resuscitating mother will resuscitate the fetus¹⁰. All Rh-negative pregnant women sustaining blunt trauma should receive anti-D immunoglobulin to prevent iso-immunisation. Finally

pregnant women should have prenatal counseling and education regarding measures and precautions to avoid trauma.

References:

1. Lynnette O. Trauma in Pregnancy. In: Guy I B. ed. *Obstetrics & Gynecologic Emergencies. Philadelphia. I B Lippincot Company, 1994:57 -75.*
2. Stone IK. Trauma in Obstetric Patients. *Obstet Gynecol Clin N Am.* 1999; 26: 459-68.
3. Connolly AM, Katz VL, Bash KL et al. Trauma and pregnancy. *Am JPerinatol.* 1997; 14: 331-6.
4. Pearlman MO , Tintinalli JE , Lorenz RP . A prospective controlled study of outcome after trauma during pregnancy. *Am JObstet Gynecol* 1990; 162: 1502 -10.
5. Poole GV , Martin IN , Perry KG et al. Trauma in pregnancy: the role of interpersonal violence. *Am J Obstet Gynecol*1996; 174: 1873 - 8.
6. Fildes I, Reed L, Jones N et al. Trauma: the leading cause of maternal death *JTrauma.* 1992; 32: 643-5.
7. Bobrowski R. Trauma in pregnancy .In: James OK, Steer PI, Weiner CP, eds. *High Risk Pregnancy-Management Option. London. W.B. Saunders, 1999:959 - 82.*
8. Hobel CI, Castro L, Rosen O et al. The effect of thigh-length support stocking on the hemodynamic response to ambulation in pregnancy. *Am JObstet Gynecol*1996: 174; 1734 - 41.
9. Clinical discussions. Trauma during pregnancy. 1996; 4(2) - [www.altanta-mfm.com / clindisclvol 4 no2 .html](http://www.altanta-mfm.com/clindisclvol4no2.html).