

MATERNAL MORBIDITY AND MORTALITY ASSOCIATED WITH DELIVERY AFTER INTRAUTERINE FETAL DEATH

Shahin Akter Jahan Habib¹, Sayeeda Sultana²

Abstract

To determine the maternal morbidity and mortality associated with delivery after intrauterine fetal death (IUFD) and to find out the place of fetal destructive procedures and cesarean section. The study design was Cross-sectional. The place of study was conducted in the Labour Room, Dhaka Medical College Hospital Dhaka from January 2005 to December 2005. Patients and Methods: All women were included in the present study who presented before the onset of labour pains, after intrauterine fetal death at 26 weeks or onward with singleton pregnancy. Assessment of maternal demographic characteristics, gestational age at fetal demise, delivery – IUFD interval, mode of delivery; vaginal with or without fetal destructive procedures/cesarean section and maternal complications were the main outcome measures. There were 5,502 live birth and 189 deliveries with intrauterine fetal death. Mode of delivery was vaginal in 87.4% and cesarean section in 12.6% of the cases. Thirty six (21%) of the vaginal deliveries were complication by lower urogenital tract injuries in certain cases, whereas 75% (18/24) of patients delivered by cesarean section developed major postoperative complications like postpartum haemorrhage, shock, endometritis, peritonitis and wound dehiscence. No maternal death was identified. Rate of delivery with intrauterine fetal death was 34.3/1000 live – birth deliveries. Maternal morbidity like perineal tear, urinary tract infection, menstrual disorder and even secondary infertility may follow after vaginal mode of delivery by forceps and destructive procedures. The frequency and severity of complications after cesarean delivery are quite higher and may rarely lead to even maternal death.

Key Words: Intrauterine fetal death. Maternal morbidity.

Introduction

Intrauterine fetal death is defined as fetal demise at ≥ 20 weeks of gestation or weight of ≥ 500 grams in developed countries.¹ Advance gestational age at demise, increased IUFD- delivery interval and intervention – delivery interval, mode of delivery and pre-existing medical conditions were identified as major

risk factors associated with increased maternal morbidity and mortality with delivery after IUFD.¹⁻⁴ Maternal mortality and morbidity was 4-6 times greater in cesarean section than vaginal delivery in emergency setting and 2 times greater in elective cases.^{5,6} Similarly, in other studies, it was recommended that destructive procedure on fetus must be considered to assist vaginal delivery as these were safer than cesarean section.^{3,4} Although maternal mortality associated with delivery after IUFD was very rare but mostly it was associated with delivery by caesarean section.^{5,7,8} Ultrasound also fails to help in decision – making regarding mode of delivery due to inadequate weight determination.⁹

In case of dead fetus, the utmost desire of an obstetrician should be to avoid caesarean section for delivery of IUFD with the exception of maternal indications as severe APH and grossly contracted pelvis.

The purpose of this study was to determine the maternal morbidity and mortality associated with delivery after intrauterine fetal death and to find out the place of fetal destructive procedures and cesarean section.

Patients and methods

This analytical cross-sectional study was conducted on women with singleton pregnancy presented in labour ward with IUFD at 26 weeks of gestation or after, from January 2005 to December 2005. All pregnant women with clinical features of premature rupture of membranes and infection (chorioamnionitis) were excluded.

IUFD was defined as fetal demise at ≥ 26 weeks of gestation based on the last menstrual period. Labour ward record and patient's files were used for collection of data in a predesigned research proforma. Variables used for analysis included maternal demographic characteristics, gestational age at fetal demise, IUFD- delivery interval, mode of delivery, number of cesarean sections, number of destructive procedures, total number of live births and stillbirths and maternal complications. The SPSS version 10.5 was used for data analysis. Maternal complications were analyzed by comparing different variables especially in relation to mode of delivery and IUFD- delivery interval and intervention- delivery interval. Student t- test (one sample and paired sample) was used for statistical significance.

The clinical parameters used for the diagnosis of IUFD were absent fetal movements perceived by mother and failure to listen fetal heart sounds by fetoscope. Ultrasound scan was carried out in all such patients not only to confirm IUFD but also to estimate the fetal weight.

1. Assistant Professor, Obstetrics and Gynecology, SZ Medical College, Bogra.
2. Assistant Professor, Obstetrics and Gynecology, BSMMU, Dhaka

Keeping in mind the low socioeconomic status of patients dealt in labour ward, economical medicine were used for vaginal delivery. Misoprostol (Cytotec) PGE1 with dose of 50 -200 mg pervaginum in gel form was used depending upon the period of gestation and response of patient. Tab cytomis 50-100 micro gm was used pervaginum. In some cases who did not respond to PGE1, Foley's catheter 20-30 ml of isotonic saline.

Result:

In this cross-sectional study, over the period of 12 months, 5,502 live deliveries and 189 deliveries for pregnancy with IUFD were identified. Rate of delivery with intrauterine fetal death in

the data presented was calculated as 34.3 /1000 live-birth deliveries. The maternal demographics of age, gravidity, parity and gestational age at the time of fetal death are shown in Table-I. The IUFD to delivery interval remained unknown in most of the cases. The detail is shown in Table-II.

Mode of delivery was vaginal in 87.4% and by caesarean section route in 12.6% of the cases. Spontaneous vaginal delivery was successful in most of the women but instrumental delivery, assisted breech extraction and carrying out of fetal destructive procedures were attempted in some of the patients to avoid caesarean section (Table-III)

Table-I: Maternal Demographic characteristics

Maternal	Mean+ SD*	Range	No of cases	Percentage	P-value
Demographic					
Maternal age yr.	28.04 ± 6.4	16–41	189	-	0.420
Gravidity		1-11	-	-	
1		33	17.46		
2		24	12.69		
3		36	19.04		
4-5		51	26.98		
6-8		27	14.28		
9-11		18	09.52		
Parity	1-9	-	-		
1		36	19.04		
2		27	14.28		
3		30	15.87		
4-5		63	33.33		
6-8		24	12.69		
9		09	4.76		
Gestational Age at fetal Demise (weeks)	34.8 ± 3.4	26-41	-	-	0.06

* Standard deviation

Table-II: Showing IUFD and intervention to delivery interval.

Time interval	IUFD –Delivery Interval		Intervention – Delivery Interval		
	No. of case	Percentage	Mean + SD	Range	P-value
Unknown	150/189	79.36	19.96 ± 7.76 hrs*	11-41 hrs	0.07
72 hours	9/189	04.76	17.28 ± 5.25 hrs@	11-40hrs	0.001
1 weeks	30/189	15.87	27.27 ± 9.44 hrs#	12-41 hrs	0.004

* Mean ± SD of intervention to delivery interval for whole study sample, @ Mean ± SD of intervention to delivery of the patients who had no complication after delivery of IUFD

Mean ± SD of intervention to delivery interval of the patients who had complications after delivery of IUFD.

Table -III showing association of mode of delivery with maternal complications and indications for caesarean section

Table-III: Showing association of mode of delivery with maternal complications and Indications for cesarean section.

Mode of delivery			Complications		
Route	No. of case	Percentage	Type	No. of case	Percentage
Vaginal	165/189	87.4%		36/165	21.8%
SVD*	123/165	74.4%	Puerperal pyrexia	24/165	14.5
- Instrumental	18/165	10.9	Perineal tear Grade-I	3/165	1.8
- Assisted breech	15/165	9.1	Preineal tear Grade-I	6/165	3.6
- Destructive procedures	9/165	5.4	UTI	3/165	1.8
Cesarean Section	24/189	12.6%		18/24	75.0%
- Indications	UTI	3	12.5		
- APH	12/24	50	Severe endometritis	6	25.0
- Previous two Sections	6/24	25	Wound dehiscence	3	12.5
- Incomplete rupture uterus	3/24	12.5	Massive PPH	6	25.0
- Eclampsia	3/24	12/5			

to avoid caesarean section (Table III). Antepartum hemorrhage remained the commonest indication of cesarean section; other indications were previous two caesarean sections, impending rupture uterus and eclampsia (Table III).

There was no mortality in any group after delivery of IUFD. The frequency of maternal morbidity in vaginal route group was 21% and in caesarean section group was 75% ($p=0.05$). Severity of complications in each group is highlighted in Table-III. In vaginal route, group 9 patients had repair of perineal tear occurred because of breech extraction (6 patients) and by the use of forceps. Urinary tract infection in one patient and puerperal pyrexia in 24 patients were settled down with medical treatment. Caesarean section group had major maternal complications i.e urinary tract infection, endometritis leading to pelvic peritonitis, uterine wound haematoma with subsequent burst abdomen and postpartum haemorrhage. The data is shown in Table-III. Three of the patients with post partum haemorrhage went into shock and was managed by obstetrical hysterectomy while other became stable by nonsurgical measures. The patient with impending uterine rupture was referred from a private clinic. Patient had the history of previous one caesarean section. Delivery induced for IUFD led to incomplete rupture of uterus after about 24 hours. Patient was received in shock in the labour ward. Laparotomy was carried out immediately, dead fetus delivered and uterus was repaired. Wound dehiscence occurred postoperatively.

All 24 patients (in both groups), who had complications after delivery of IUFD, had significantly prolonged intervention to delivery interval ($P=0.001$). The data is shown in Table III in detail.

Discussion :

The study was carried out to evaluate the maternal morbidity and mortality associated with different modes of delivery like caesarean section or vaginal route. In case of later, it also highlighted the role of fetal destructive procedures to avoid caesarean sections in the scenario of IUFD at or after 26 weeks of singleton pregnancy. This information may help health care providers decide the mode of delivery and provide a clue as to do fetal destructive procedure to assist vaginal delivery so that a better outcome may be achieved by minimizing the postdelivery complications.

In the present study, range of gravidity as well as parity was 1-11 and 1-9 respectively. Majority of women fell in high parity group because these pregnant ladies belonged to such group of population who had high illiteracy rate and poor socioeconomic setup, being resident of rural areas. The maternal demographics of age, gravidity and parity in the present study were almost consistent with other local studies undertaken for general population^{4,5,10} but was quite different from the well developed and educated western populations.¹

The high incidence of abortions, late pregnancy failure and maternal morbidity in this study was probably due to higher rate of teenage marriages, because of poverty, social and religious trends of early marriages in our society. Similar studies carried out in America by Magann at all.1 and others^{10,12,13} reported 84.5 pregnancies per thousand women, among unmarried teenage school girls, due to early onset of sexual activity with poor obstetrical outcome. No doubt their social status was high, the only factor affecting the poor obstetric outcome appeared occurrence of pregnancy in teenage group.

The time period between IUFD and delivery is important because of the remote but serious risk of coagulation defect. This risk is low initially but increases with time, particularly in case time period exceeds 4 weeks.¹⁴ In this study, in 15.87% cases, time period between fetal demise and delivery was one week and in 4.76% cases, it was 72 hours, while in the rest of patients time period could not be estimated due to lack of any antenatal records. It must be less than 4 weeks as no complication of disseminated intravascular coagulation was faced in any of these cases during the study.

Pharmacological drugs, used in this study, for vaginal mode of delivery were cheaper, easily available and effective for termination of pregnancy after fetal demise. Minimum side effects were found with PGE1 (Misoprostol) in gel form with dose of 50-200 microgram vaginally every 6 hourly. New pharmacological agents like Mifepristone and Sulprostone were not used due to non-availability and high cost. The recent studies, where these agents were used, reported more side effects and sometimes serious complications like ruptured uterus as compared to conventional methods^{1,8,15-18} but were being used effectively to reduce the induction to delivery interval. Short induction to delivery interval is particularly important in case of fetal demise when, during progress of labour, occurrence of rupture of membrane takes place. Delivery process should be completed as early as possible, as dead fetal tissue is an ideal source of spread of anaerobic infection in spite of antibiotic administration.^{1,8,14-16} In the present study, delivery process of dead fetus was tried to be completed within 24-48 hours to avoid ascending infection.

Mode of delivery after intrauterine fetal death always remained a matter of great concern for the obstetricians. It was well proven that the maternal mortality and morbidity was quite higher in caesarean section as compared to vaginal delivery^{1,3,6,19,20}. In this study, 87.4% of pregnant women with IUFD were delivered by vaginal route and 12.6% by caesarean section. It was found that 24 patients suffered from puerperal pyrexia, 3 developed urinary tract infection and 9 patients required perineal tear repair among 165 patients who delivered by vaginal route. On the other hand 18 (75%) patients out of 24, who delivered by caesarean section developed complications like postpartum haemorrhage, endometritis, peritonitis, shock, urinary tract infection and wound dehiscence.

Similarly in a large size study, Megann et al.¹ reviewed 498 singleton pregnancies and 24 twin pregnancies after IUFD. According to their report, 95.2% cases delivery vaginally and 4.8% cases by caesarean section. In vaginal route group, 10% women required surgical repair of genital tract injuries. About 50% cases delivered by caesarean section developed complications of endometritis, 25% suffered from disseminated

intravascular coagulation and 12.5% developed puerperal sepsis along with ARDS. They reported one maternal death due to HELPP syndrome.

Gupta and Chitra³ from India did similar study. They reported 56 cases delivered vaginally by fetal destructive procedures and 27 cases by caesarean section. Their findings were consistent with this study as they found high rate of major postdelivery complications including one maternal death in caesarean section group. Similarly, Tariq and Korejo⁴ reported 12.5% maternal morbidity and mortality in women with IUFD, who delivered vaginally after fetal destructive procedures.

Conclusion:

Maternal morbidity may accompany the management and delivery of intrauterine fetal death. Spontaneous vaginal delivery is possible in majority of the patients. Care must be taken for induction of labour in patients with history of previous one C-section. Fetal destructive procedures are safe in experienced hands and useful to reduce the maternal morbidity. The decision of caesarean delivery should only be taken if there is an absolute indication for it, as it is associated with high maternal morbidity, and rarely, mortality may accompany if prompt action is lacking to treat the postoperative complications.

References:

1. Magann EF, Chauhan Sp, Bofill JA, Waddell D, Rust OA, Morrison JC. Maternal morbidity and mortality associated with intrauterine fetal demise: five-year experience in a tertiary referral hospital. *South Med J* 2001; 94:493-5.
2. Visentin L, Leo L, Alemanno MG, Arduiro S, Bellino R ET AL. Management of patients with intrauterine fetal death. *Clin Exp Obstet Gynecol* 1996; 23:263-7.
3. Gupta U, Chitra r. Destructive operations still have a place in developing countries. *Int J Gynaecol Obstet* 1994;44: 15-9.
4. Tariq TA Korejo R, Evaluation of the role of craniotomy in developing countries. *J Pak Med Assoc* 1993; 43:30-2.
5. Aleem M, Bashir A, Zia F, Iqbal N. Maternal deaths with caesarean section: a three years study. *Specialist* 1994;11: 1-7
6. Najami RS, Bano F Indications, complications and fetal outcomes: a comparison between emergency and elective caesarean section. *Specialist* 1995;11:277-82.
7. Amjad T, Akhtar S. Termination of pregnancy with fetal death second trimester: foley's catheter versus extra amniotic prostaglandins *J Coll Physicians Surg Pak* 1999;9:403-5.

8. Prasad RN, Ratnam SS. Uterine rupture after induction of labour for intrauterine death using the prostaglandin E2 analogue sulprostone. *Aust N Z J Obstet Gynaecol* 1992;32:282-3.
9. Conway DL. Choosing route of delivery for the macrosomic infant of a diabetic mother: cesarean section versus vaginal delivery. *Matern Fetal Neonatol Med* 2002;12:44208
10. Conde-Agudelo A, Belizan JM, Lammers C. Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: cross-sectional study. *Am J Obstet Gynaecol* 2005;192:342-9.
11. Ayub F. Teenage pregnancy; role of various risk factors and socio-economic demographics on obstetrical outcome [dissertation]. Karachi: College of Physicians and Surgeons Pakistan; 2002.
12. Ventura SJ, Abma JC, Mosher Wd, Henshaw S. Estimated pregnancy rates for the United States, 1999-2000: an update. *Natl Vital Stat Rep* 2004;52:1-9.
13. Gilbert W, Jandial D, Field N, Bigelow p, Danielsen B. Birth outcomes in teenage pregnancies. *J Matern Fetal Neonatal* 2004;16:265-70.
14. King M, Bewes PC, Cairns J, Thornton J, (edi) Primary surgery. Oxford: Oxford University Press, 1990.
15. Wagaarachchi PT, Ashok PW, Narvekar NN, Smith NC, Templeton A. Medical management of late intrauterine death using a combination of mifepristone and misoprostol. *BJOG* 2002; 109:443-7.
16. Fairley TE, Mackenzie M, Owen P, Mackenzie F. Management of late ontrauterine death using a combination of mifepristone and misoprostol- experience of two regimens. *Eur J Obstet Gynecol Reprod Biol* 5005;118:28-31.
17. Hossian N, Soomro N, Umer A. Medical management of second trimester fetal demise using misoprostol. *J Coll Physicians Surg Pak* 200;12:735-7.
18. Scher J, Jeng DY, Moshirpur J, Lerenvi TD. A comparison between vaginal prostaglandin E2 suppositories and intrauterine extra-amniotic prostaglandins in the management of fetal death in utero. *Am J Obstet Gynecol* 1980;137:769-72.
19. Dorfman SG, Grimes DA, Cates W. Maternal death associated with antepartum fetal death in utero , United States, 1972 ti 1978. *South Med J* 1983;76:838-43.
20. Dutta D. A critical evaluation of maternal death in cesarean section met in rural onstetric practices. *J Obstet Gynaecol India* 1979;29:143-7.