

Comparison of incidence of intra uterine fetal death and its causes at an interval of five years in Kathmandu University Hospital

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ABSTRACT

Aims: To compare the incidence of intra uterine fetal death and its causes at an interval of five years.

Methods: This retrospective study was conducted to compare the incidence of intrauterine fetal death and its causes during 2010 and 2011 versus 2016 and 2017.

Results: A total of 4219 deliveries conducted in the year 2010 and 2011, of them 90 (2.13%) were intrauterine fetal death. Likewise altogether 5873 deliveries conducted in the year 2016 and 2017, of them 105 (1.79%) were intrauterine fetal death. Mean age of mothers with fetal death were similar (25.47±5.64 vs 25.76±5.7 years; $p>0.05$). Common presenting complaints were reduced/absent fetal movement, abdominal pain, pre-labor rupture of membranes and antepartum hemorrhage. The majority of women were at low risk. Fetal characteristics of the intrauterine fetal deaths were almost comparable except fetal weight. Dead fetuses weighed lower significantly in the year 2016 and 2017 (2182.78±821.04 vs 1943.62±912.19 gram; $p=0.05$). In both periods, majority of stillborn babies appeared to be non-dysmorphic. There were significant numbers of referred-in cases who have complications.

Conclusions: The incidence of intrauterine fetal death is decreased in Kathmandu University Hospital over the years and referred-in cases are more for the obstetric care.

Keywords: fetal death, fetal movements, nuchal cord, placenta

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INTRODUCTION

Intrauterine fetal death (IUFD) is a painful and terrible event. Timely detection of its risk factors and appropriate interventions are ways to prevent this condition. World health organization (WHO) defines IUFD as death prior to the complete expulsion or extraction of a product of conception from its mother after the age of viability American College of Obstetricians and Gynecologists (ACOG) considers 22 weeks as cut off point for viability.^{1,2} It is classified into early (<20 weeks), intermediate (20 to 27 weeks) and late (>27 weeks of gestation).

In countries where there is no adequate neonatal care facilities the pregnancy loss before 28 weeks of gestation is still a challenge for survival. Hence the IUFD cases ≥ 28 weeks of gestations are included in this study.

There were very few IUFD related studies conducted in Nepal till now.³⁻⁶ A few years back, a two years long study was conducted in same institution on probable causes of IUFD with incidence of 2.13%.³ Over the years, it was observed that the IUFD rate has been decreasing in Kathmandu University Hospital (KUH). Hence, this study was conducted to compare the incidence of IUFD and its causes at an interval of five years.

METHODS

This retrospective study was conducted in Department of Obstetrics and Gynecology to compare the incidence of IUFD and its causes at an interval of five years (i.e. 2010 and 2011 versus 2016 and 2017), reviewing the entire outpatient department, inpatient and operation theater records. Relevant demographic parameters were also analyzed. Cases of multiple pregnancy and fetal death diagnosed by ultrasound

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before 28th week of gestation were excluded. Ethical clearance was taken from the hospital IRC. All data were analyzed by SPSS 16 packages using rate, mean, standard deviation and Chi square test.

RESULTS

A total of 4219 deliveries conducted in the year 2010 and 2011, of them 90 (2.13%) were intrauterine fetal death with incidence of it was 2.13%. Mean age of mothers in the fetal death group was 25.47±5.64 years. Forty percent of them were of primiparous.

Most of the women with IUFD presented to the hospital with the complaints of reduced/absent fetal movement (n=37), antepartum hemorrhage (APH), (n=6), abnormal vaginal discharge (meconium stained) (n=3) and abdominal pain or preterm labor in the year 2010 and 2011.

Dead fetuses had significantly lower weight (2182.78±821.04gram) for gestational age. Nearly half of them (44.4%) were expelled at preterm age (before 37 weeks). Incidence of IUFD gradually decreased as parity advanced [Table-1]. The incidence was higher in patients receiving antenatal care outside KUH [Table- 2].

Altogether 5873 deliveries conducted in the year 2016 and 2017, of them 105 (1.79%) were IUFD with incidence of it was 1.79%. Mean age of mothers in this group was 25.76±5.7 years. More than half of mothers were of primiparous and fetuses expelled were preterm 54.3% and 45.7% respectively.

In this period, common presenting complaints were reduced/absent fetal movement (n=52), abdominal pain (n=37), pre-labor rupture of membranes (n=10) and APH (n=9).

Mean weight of expelled fetus was 1943.62±912.19 gram. About two thirds (65.7%) of them were receiving antenatal care outside KUH [Table- 2]. Incidence of IUFD was gradually decreased as parity advanced in this period as well [Table-1].

Table-1. Maternal variables of the IUFD cases

Variables	In the year 2010 and 2011 (n=90)	In the year 2016 and 2017 (n=105)	P-value
Maternal age (years)	25.47±5.64	25.76±5.7	>0.05

Parity	Para1-40%, Para 2-27.8%, Para 3-21.1%, Para 4-5.6%, ≥ Para 5-5.6%	Para1-54.3%, Para 2-25.7%, Para 3-6.7%, Para 4-6.7%, ≥ Para 5-6.7%	
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Table-2. Comparison of different variables

Variables	In the year 2010 and 2011 (n=90)	In the year 2016 and 2017 (n=105)	P-value
Parity			
Primi	36 (40%)	57 (54.3%)	>0.05
Multi	54 (60%)	48(45.7%)	
ANC			
Outside/no ANC	61 (67.8%)	69 (65.7%)	>0.05
KUH	29 (32.2%)	36 (34.3%)	
Total	90	105	

* Significant at 95% level of confidence

There were differences in parity and antenatal care places of mothers but statistically not significant [Table-2]. The majority of women were at low risk. Associated medical disorders included preeclampsia, diabetes, anemia, heart disease, asthma and sepsis.

And fetal characteristics of the IUFD cases were almost comparable except fetal weight [Table-3]. Sixty six (73.3%) and 91 (86.7%) babies were born through vaginal route in former and latest period respectively. Most of the fetal deaths were expelled within 24 hours. Majority of stillborn babies appeared to be non-dysmorphic.

Table-3. Fetal characteristics of the IUFD cases

Variables	In the year 2010 and 2011 (n=90)	In the year 2016 and 2017 (n=105)	P-value
Gestational age	Preterm -40 (44.4%)	Preterm - 60 (57.1%)	>0.05
	Term - 48 (53.3%)	Term - 41 (39.1%)	>0.05
	Postterm - 2 (2.2%)	Postterm - 4 (3.8%)	
Fetal weight (gram)	2182.78± 821.04	1943.62± 912.19	<0.05*
Fetal gender	Male - 61.1%	Male - 54.3%	>0.05
	Female - 38.9%	Female - 45.7%	

* Significant at 95% level of confidence

In the former period, 14 cases had cord prolapse, three had nuchal cord and one case had true knot. In this period, there were six cord prolapse cases and five nuchal cord cases. There were 13 and 18 referrals in the former and later period respectively.

DISCUSSION

Studies have proved that fetal outcome worsens with advancing maternal age.⁷⁻¹⁰ Mean age of the mothers in both period and other studies³⁻⁶ in Nepal was quite similar [Table-1]. There were seven cases of more than 35 years of age in both these periods but there were no documents of routine screening for chromosomal aneuploidy.

The incidence was higher in patients receiving antenatal care outside KUH. In a study by Raymond et al showed stillbirth was not associated with primiparity but it seems that in multiparous women, previous delivery of live birth is a protective feature.⁸ Primiparous cases were 40 and 54.3% % respectively in these periods. And incidence of IUFD gradually decreased as parity advanced in this period as well [Table-1]. Though there were differences in parity, antenatal care places and address of mothers but statistically not significant in these periods [Table 2 and 3].

In more than half of the recorded cases (54.7%) the complaint was of reduced or absent fetal movements. Reduced fetal movements can be associated with adverse fetal outcome. Efkarpidis S et al found that a proportion of women did not have any complaint at all, with 14% of IUFDs detected on a routine antenatal clinic appointment when the fetal heart was not audible.¹¹ A study (n=436) carried out from July 2013 to December 2014 in the same institute, revealed decreased fetal movements problems affect 5 to 15% of pregnant ladies.¹² Presenting complaints in IUFD cases were similar in both these periods.

Efkarpidis S et al found that there is a strong association between fetal growth restriction and IUFD. An improvement in the identification of intrauterine growth restriction (IUGR) may improve the outcome for some pregnancies. However, the majority of pregnancies complicated by IUFD were apparently low-risk pregnancies in which IUGR was not detected antenatally.¹¹ A study conducted in same

institute by Shrestha et al. the incidence of IUGR was 1.08% with 5.5% perinatal deaths among them.¹³

There were cases of undiagnosed diabetes in the group of pregnancies that ended in stillbirth as all these women were investigated after diagnosis of fetal death. A prospective study (n=1598) related to gestational diabetes screening using 50 gram glucose, detected incidence of gestational diabetes was 0.75% at KUH.¹⁴

In these studies, risk factors like body mass index, smoking habit and maternal blood group were not studied but some studies have confirmed an association between these risk factors and risk of fetal deaths,^{8, 10, 15-17} but others have not.¹⁸

Studies done by Petridou E et al and Parazzini F et al found that there is a possible association between sex of the fetus and risk of stillbirth.^{7,19} Other studies suggested that male fetuses are more likely to suffer from antenatal hypoxia (ante- or intra-partum). Other studies have shown an association of male fetal sex with intra-partum hypoxia (fetal distress) in terms of low Apgar scores at 5 minutes, low umbilical artery pH, and risk of emergency cesarean section.²⁰⁻²² About two third 55(61.6%) and 57 (54.3%) babies born were male in year 2010 and 2011 and in the year 2016 and 2017 respectively but it was not statistically significant in our study [Table-3]. Though dead fetuses weighed lower significantly in the year 2016 and 2017, mean weight of the IUFD fetuses in these periods [Table-3] are similar to other studies^{5,6} in Nepal. The gestational age of the IUFD cases was not much different in these periods [Table-3].

The postmortem examination helps in finding probable causes after such a tragic event. Though postmortem examination was not done in these periods, placenta was sent for histopathological examination in most of the cases. Tamrakar SR et al analyzed pathological reports of placenta of 288 IUFD cases. Of them, 213(74%) were normal where as rest were infection 53(18.3%), chorangioma 10(3.5%), infarction 8(2.8%), chorangioma 3(0.9%) and intervillous hemorrhage 1(0.3%).²³

In a study of fetal histology and stillbirth, Genest DR et al estimated that 80% of all IUFDs are expelled within one week after death.²⁴ Bias attributed to differences between fetal weight at time of death and

weight at the time of delivery is likely to be limited.²⁵

Majority of stillborn babies appeared to be non-dysmorphic. In the year 2010 and 2011, two fetuses were recorded with multiple congenital abnormalities and another one had cleft lip and palate. And 25 fetuses were macerated. In the year 2016 and 2017, nine fetuses had congenital anomalies (like anencephaly, Dandy Walker syndrome, hydrop fetalis, multicystic kidney disease etc). And 52 fetuses were macerated.

Kumari S et al found 258 (2.15%) babies had cord abnormalities. Nearly 32% of these cases had fetal distress and 20.5% had low Apgar score. Of the various cord problems, nuchal cord was noted in 79.1%, cord prolapse in 12.4% and true knots in 3.9% cases. Perinatal mortality rate with cord problems was 85.27/1000 births.²⁶ There were instances of cord problems in these periods. A study conducted in same institute by Tamrakar SR et al. found the incidence of nuchal cord was 6.85%.²⁷

There were significant numbers of cases who had antenatal care outside KUH [Table-2], and referred at last moment with IUFD and its complications. In the year 2010 and 2011, six cases transferred in utero with hand prolapse, additional two cases with transverse

lie (TL), one each case with shoulder presentation and fetal distress. Besides, other two cases referred with obstructed labour, one underwent hysterectomy with bladder repair and another had uterine rupture so underwent subtotal hysterectomy. In the year 2016 and 2017, two cases were referred with severe preeclampsia, one each case with shoulder dystocia, cord prolapse and TL. One additional case was referred with abruption, hand prolapse and rupture uterus, who underwent laparotomy and repair of ruptured uterus after extraction of dead fetus. Four cases needed intensive care unit care, five cases needed blood transfusions (ranging three to four pints). Two cases presented in hemorrhagic shock, one case in diabetic ketoacidosis and one in severe sepsis.

CONCLUSIONS

Intra uterine fetal death is important indicator of obstetric care. The incidence of IUFD is decreased in KUH over the years.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

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