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Classification of Stillbirth by Relevant Condition at Death (Re Co De) at a Tertiary Care Center in Eastern Nepal

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Abstract

Aims: Stillbirth, defined as birth of baby with no signs of life at or after 22 completed weeks of pregnancy, is one of major contributor to perinatal mortality. Millions of women experience stillbirth each year, yet these deaths are unsupported and understudied. Relevant condition at death (Re Co De) classification system for defining relevant clinical categories for stillbirth significantly decreases the proportion of stillbirths previously classified as unexplained.

Methods: A retrospective observational study was carried out to classify stillbirth by Re Co De classification System at Obstetrics and Gynecology department of B.P Koirala Institute of Health Sciences from January 1st 2019 to December 31st 2019 (one year). The medical records of the patients were studied, relevant data entered and analyzed in SPSS statistical software.

Results: The stillbirth rate was 14.61/1000 birth. The majority of women 87.2% were in between 21-35 years of age. Multigravida women were 52.4%. Most of the cases of stillbirth were unbooked (90.2%) and among them 62.2% had less than four antenatal visits. There were 45.1% of stillbirth were between 28 to 36 weeks of gestation and 77.4% were antepartum stillbirth. Fetal group contributed to 32.1% of stillbirth followed by maternal group of 25%. Fetal growth restriction was seen in 21.3% of stillbirth followed by oligohydramnios in 16.5% of cases. Among maternal group, Stillbirth due to hypertensive disorder were seen in 12.4%, followed by diabetes mellitus in 6.7% of cases.

Conclusion: The classification of stillbirth by Re Co De showed a better understanding of causes of fetal death and it can help clinician and public health specialist to emphasize on issues previously considered as unexplained.

Introduction

World Health Organization (WHO) defines stillbirth as a delivery of the fetus after 22 completed weeks of gestation, weighing 500gms or more with no signs of life at or after delivery." Stillbirth remains a major contributor to perinatal mortality especially in the developing country.[1,2] Since stillbirth involves loss of life, it can be viewed as a tragic event. Many parents experience a psychological issue after stillbirth including anxiety, depression, and post-traumatic stress disorder.[3]

Around 2.5 million stillbirths occur each year and half of these occur during intrapartum period. Among them, 98% occur in middle and low socioeconomic countries like ours.[4] Every newborn action plan by 67th WHO assembly, targeted stillbirth of around 12/1000 live birth in every country. In Nepal, stillbirth rate is high around 18/1000 live birth.[5]

In the modern era, where lots of work is going on for maternal health, a women's expectation of live baby seems to be missing from the recent world health agenda.[1] Stillbirth is a global endemic and expert understanding of stillbirth, alongside maternal and neonatal loss and strategic programmatic action is needed to make stillbirth count.

There are still lacunae in knowledge of the biomedical cause of stillbirth due to lack of clear and reliable data from the developing countries like ours. Identifying the cause of stillbirth also remains challenging because of various cultural and religious beliefs for an autopsy and or placental biopsy.[6, 7]

The Re-Co-De classification system is derived from a population-based cohort review in west midlands perinatal center, England. This classification system seeks to identify the relevant condition at the time of fetal death.[8] This is mainly based on clinical information at the time of fetal death rather than on autopsy or placental biopsy, thus significantly decreases the proportion of stillbirth which is classified as unexplained.[6]

Therefore, this study can help the clinician to understand what went wrong and assist in counseling the bereaved couple and families about the loss as well as appropriate preventive strategies can be offered.

Methods

This is a retrospective study conducted from January 1st 2019 to December 31st 2019 (one years) at B.P Koirala institute of health sciences, a tertiary care teaching hospital of eastern Nepal. This study was approved by Institutional Review Committee (IRC).

A total of 164 cases of still birth occurred during the study period. All deliveries and outcomes were retrieved from the record in the birth register. Using each patient unique inpatient number, case files were obtained. Demographic variables, risk factors like oligohydramnios, polyhydramnios, preeclampsia etc. were recorded from the files.

Data regarding mode of delivery, timing of fetal death, fetal gender, birth weight, condition during delivery were recorded. Gestational age was calculated from last menstrual period and further confirmed by first trimester dating scan whenever available. Clinical estimation of gestational age was done where dating scan was not available.

Stillbirth is defined as death of fetus at or after 22 weeks of gestation and or fetal weight >500gms. Antepartum death is death which occurred before the onset of labour and intrapartum is death which occurred during labour.

Fetal growth restriction is defined as fetal weight less than 10th percentile, oligohydramnios was defined as amniotic fluid index less than 8 cm and polyhydramnios as amniotic fluid >24 cm. Pre-eclampsia was defined as hypertension with proteinuria after 20 weeks of gestation.

Preterm delivery was defined as delivery before 37 completed weeks of gestation. Stillbirth is considered as fresh if skin was intact and macerated if there was peeling of skin, skull was soft, umbilical cord and amniotic fluid was darkly stained.

Results

Total number of deliveries during study period (January 1st 2019 to December 31st 2019) of one year as per hospital record was 11,222. Total number of stillbirths was 164, giving stillbirth rate of 14.61/1000 birth.

Table 1 shows maternal characteristics; Maximum mother were in age group between 21-35 year. Ten females were of less than 20 years of age and 11 women were of more than 35 years of age, 47.6% of mother were primigravida and 52.4% were multigravida. Six mothers had experienced prior stillbirth. Maximum number of females were unbooked cases (90.2%). More than half of women (62.2%) not even had minimum recommended ANC visits and 18 women never had attended single ANC visit.

Table 2 illustrates fetal characteristics: Maximum number of stillbirths were between 28 to 36 weeks of gestations (45.7%) followed by 43.9% after 37 weeks of gestations. Women delivered spontaneous in 41.5% cases where as 39.6% of women were induced with mifepristone followed by misoprostol or misoprostol alone. Lower segment cesarean section was done in 17.7% women. Most of the babies weighted between 1-2.5kg (47%). Antepartum fetal death occurred in 77.4%. Male fetus (95) outnumbered female fetus (68) and sex of one fetus was unidentified. Signs of maceration were seen in 55.5% of fetus and 44.5% were fresh stillbirth.

Table-3 showed distribution of etiology of stillbirth by Re Co De classification. Stillbirth at less than 28 weeks, in between 28 to 36 weeks and at term were 10.4%, 45.7%, 43.9% respectively. Fetal group contributed to most of the stillbirths i.e 32.1% followed by maternal group 25.0%. Fetal growth restriction, oligohydramnios, pre-eclampsia, abruption placenta were the main contributors of stillbirth in between 28 to 36 weeks of gestation.

Stillbirth (17 cases) before 28 weeks were mainly due to lethal congenital anomalies. Ten cases of lethal congenital anomalies were detected late as they never had antenatal visits or undergone anomaly scan. Causes of stillbirths near term were mainly due to fetal growth restriction followed by oligohydramnios and pregnancy induced hypertension. Fetal asphyxia was major cause of intrapartum stillbirth. No definite causes were found in 18(11%) cases of stillbirth and among them nine cases were in unclassified group.

Table-1: Demographic profile

Maternal characteristics	Number (%)
Age in years <20years 21-35years >35years	 10(6.1%) 143(87.2%) 11(6.7%)
Parity Primigravida Multigravida	 78(47.6%) 86(52.4%)
Booking status Booked Unbooked	 16(9.8%) 148(90.2%)
Prior miscarriage Yes No	 24(14.8%) 140(85.4%)
Prior stillbirth Yes No	 6(3.7%) 158(96.3%)
ANC visits <4visits >=4visits No ANC	 102(62.2%) 44(26.8%)

Table 2: Fetal characteristics

Characteristics	Number (%)
Gestational age(weeks) <28 28-36 >37	 17(10.4%) 75(45.7%) 72(43.9%)
Mode of delivery Spontaneous vaginal Induced vaginal Instrumental LSCS	 68(41.5%) 65(39.6%) 2(1.2%) 29(17.7%)
Time of death Antepartum Intrapartum	 127(77.4%) 37(22.6%)
Birth weight(kg) <1kg 1-2.5kg >2.5kg	 32(19.5%) 77(47.0%) 55(33.5%)
Condition of fetus Fresh Macerated	 73(44.5%) 91(55.5%)
Gender of the fetus Male Female Unidentified	 95(57.9%) 68(41.5%) 1(0.6%)

Table 3 Classification of stillbirth according to Re Co De classification at various trimesters of pregnancy

Group	Causes of stillbirths	Number (%)	Gestational age <28weeks	Gestational age 28-36weeks	Gestational age >37weeks
A-Fetus	A1-lethal congenital anomaly	15(9.1%)	5	6	4
	A2-infections	3(1.8%)	-	2	1
	A3-non-immune hydrops	-	-	-	-
	A4 iso immunization	-	-		-
	A5-fetomaternal hemorrhage	-	-		-
	A6-Twin-Twin transfusion syndrome	35(21.3%)	-	22	13
	A7-fetal growth restriction				
B-Umbilical cord	B1-Cord prolapse	4(2.4%)	1	1	2
	B2-cord loop/knot	1(0.6%)	-	-	-
	B3-velamentousinsertion		-	1	-
C-Placenta	C1-Abruptio	11(6.7%)	1	5	5
	C2-Previa	4(2.4%)	1	2	1
	C3-Vasa previa	-	-	-	-
D-Amniotic fluid	D1-Chorioamniotis	1(0.6%)	-	-	1
	D2-Oligohydraminos	27(16.5%)	3	12	12
	D3-Polyhydraminos	3(1.8%)	-	3	-
E-Uterus	E1-Rupture	5(3.0%)	-	4	1
	E2-Uterine anomaly	1(0.6%)	1	-	-
	E3-Obstructed labour	-	-	-	-
F-Mother	F1-Diabetes mellitus	11((6.7%)	-	2	9
	F2-Thyriod	-	-	-	-
	F3-Essential hyper tension	4(2.4%)	-	3	1
	F4-Gestational hyper tension	18(11.0%)	1	12	5
	F5-Antiphospolipid antibody syndrome	-	-	-	-
	F6-Cholestasis	1(0.6%)	-	-	1
	F7-Drug abuse	-	-	-	-
	F8-Infections	3(1.8%)	-	2	1
	F9-Anemia, heart diseases	4(2.4%)	2	-	2
G-Intrapartum	G1-Asphyxia	12(7.3%)	-	3	9
	G2-Birth trauma	-	-	-	-
H-Trauma	H1-External	-	-	-	-
	H2-Itragenic	-	-	-	-
I-Unclassified	I1-No relevant condition identified	18(11.0%)	3	6	9
	I2-No information available	-	-	-	-

Discussion

Millions of family experience stillbirths each year and those losses remains unsupported, and understudied in majority of cases. Stillbirth remains a major contributor to perinatal mortality worldwide.[9] Approximately 98% of stillbirth has been reported to occur in developing countries. For reduction of this global epidemics better understanding of its cause is required. There are many classification systems of stillbirth available, but majority of them report two third of stillbirth as being in unexplained group.

This retrospective analysis of stillbirths tried to classify the causes according to newer Re Co De (relevant condition at death) classification system which enabled causes of 91% of stillbirth to be assigned to a relevant condition, leaving only 11% in unclassified or unexplained groups in contrast to other classification systems like Wigglesworth classification system which left maximum number of stillbirths unexplained.[8,10]

The stillbirth rate in our study was 14.61/1000 live births, which is lower than the national reported data i.e. 18/1000 live births (2015)5. Low rate observed in the study can be explained by differences in prevalence rate of stillbirth across three ecological zone of Nepal, and the rate is 17/1000 live births in terai region.[11]

The main contributors of stillbirth in the study were more in fetal group than in maternal group. Fetal growth restriction, oligohydramnios, pre-eclampsia, abruptio placentae collectively grouped as ischemic placental disease were main contributor of stillbirth in a study by Rajgopal et al.3 The most common condition associated with stillbirth was failure of fetal growth (21.3%) which was similar to study by Bharti et al from India (26.7%).[12] In our study, fetal congenital anomalies were observed in 9.1% as compared to 11.6% in Rajgopal et al's study. [3]

Among maternal group, contributing to stillbirths, hypertension complicating pregnancy, the most common medical complication of pregnancy, accounted for 11% of all stillbirths in the study, which consistent with study Shrestha et al's study (14%).[13] Stillbirth rate was higher in age group 21 to 35 years of age (87.2%) in our study, which was also consistent with Shrestha et al's study 71.4%.[13] In contrast, Bhusal et al's study reported that women aged 35 years and above were more likely to experiences stillbirth, similar to a case control study conducted in Nepal.[5]

Worldwide 6.7% of stillbirth are attributable to older maternal age (>35 years).However, our result contrast with this because most of the referrals come from rural areas, where females get marry early and conceive soon. Kc et al. studied association between antenatal checkup and incidence of stillbirth and observed that stillbirth was more common in women who lack antenatal checkup. Similar findings were seen in our study where maximum number of stillbirths was in unbooked cases (90.2%) and 62.2% of women not even had minimum recommended antenatal visits.[4]

Our study showed that maximum number of stillbirths (451%) occurred in between 28 to 36 weeks of gestations similar to finding of Kc et al which showed that risk of stillbirth increases with premature deliveries.[4, 14] Reduction in preterm deliveries is an important step to prevent stillbirths measure. It was estimated that one third of stillbirth occurred in intrapartum period according to some studies.[1,9] However, in contrast, we found there were more stillbirth (77.4% in antepartum period). This may be due to referrals of antepartum fetal deaths from other centers to our institute for safe delivery. Also, intrapartum labor monitoring is done intensively around the clock in our center.

Male stillbirths outnumbered female that is 57.9% vs 41.5% in this study. The probable cause may include x-linked congenital conditions, increasing the risk of preterm labor and poor fetal growth for male babies.[1] The preferred mode of delivery was vaginal delivery in 82.3% cases which was consistent with findings of Devi et al.[15]

Conclusion

Stillbirth is a tragic pregnancy outcome and remain major public health problem in our part of the world. Better understanding of underlying cause is worthy for its prevention. Re Co De classification system is based on clinical findings, thus significantly decreases the number of unclassified stillbirths as compared to previous systems. To minimize stillbirths, plan and policies should be focused on its major causes such as fetal growth failure, and proper preventive strategies should be undertaken accordingly.

Consent

Not taken given the anonymous retrospective nature of data collection.

Ethical approval

The study was conducted after getting ethical clearance from the IRC.

Conflict of Interest: None

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Author have declared no conflict of interest

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