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Analysis of stillbirths at a Tertiary Care Centre using ReCoDe Classification System

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Background and Introduction

One of the most feared outcomes of pregnancy is a stillbirth delivery for any obstetrician or any antenatal woman and her family. It has a lasting impact on the physical and psychological health of the mother. It has been estimated that 98% of all the stillbirths occur in low and low-middle income group countries [(1)]. Preventing stillbirths has gained a global attention. Every Newborn Action Plan is a resolution passed by the World Health Assembly and it spells out the target of 12 stillbirths per 1000 births to be achieved by all nations by 2030[(2)]. This is in compliance with the United Nations Sustainable Development Goals.[(3)] India has also come a long way in decreasing stillbirth rate over the last two decades to 12.4 in the years 2019-2020[(4)]. In the year 2000 it was 29.6 and the percentage decline during the years 2000 to 2019 was 53% [(5)]. This is attributed to the untiring efforts of the government in increasing the literacy rate, promoting early pregnancy registration, routine antenatal check-ups, strengthening the referral system, better transportation facilities for the antenatal women and institutional deliveries. For international comparison, WHO has defined stillbirth as birth of a foetus at gestational age more than 28 weeks, with foetal weight more than 1000 grams, crown rump length greater than 35 cm with no signs of life at birth [(6)].

Adequate efforts must be made on the part of the treating doctor to identify and properly document the cause of still birth in all cases so that subsequent pregnancies of the patient may be managed accordingly and the patient can have a good foeto-maternal outcome in the future pregnancies. Conditions like severe pre-eclampsia, abruptio placentae, gestational diabetes mellitus and thrombophilias are known for endangering the maternal life as well. Hence the importance of identifying and documenting the cause of still birth cannot be over-emphasized.

Many classification systems have been developed till date for the purpose of classifying still births. Wigglesworth and Aberdeen system of classifying still births were used earlier but their main disadvantage was that the cause of many still births remained unidentified. Now ReCoDe (Relevant Conditions at Death), CODAC, Tulip and ICD-PM classification systems are being used more commonly as they were found to have better performance on Infokeep scores [(7)]. They have easier

applicability on clinical ground and are able to identify the underlying cause of still birth in most of the cases.

Objectives

To classify still births using ReCoDe classification.

Methods-

It was a Retrospective cohort Study conducted in the Department of Obstetrics and Gynaecology at Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow over a period of two years i.e. from 1st January 2022 till 31st December 2023. Data of all stillborn deliveries in the department during this period was collected and analysed. All women who came to us with intra-uterine foetal demise at or after 28 weeks of gestation or those who had an intrapartum loss were included in this. Their demographic features, clinical history, examination findings at the time of admission and course till delivery were recorded and reviewed. Assessment of stillbirths was done using ReCoDe classification.

Results

On analysing the delivery records, it was found that 481 stillborn deliveries were found to be eligible to be included in the study.

Out of the 481 women with stillbirths, 302 were found to have less than 3 antenatal visits in pregnancy whereas 179 had more than or equal to 3 antenatal visits.

It was seen that 61.75 % of these women were in the age group of 25 to 35 years and 37.43% were less than 25 years. Only 0.82% women were above 35 years.

34.30 % of all the still births came in the gestational age of very early preterm births, 22.45% were early preterm births and 18.91% were late preterm births. Hence, 364 out of 481 still births i.e. 75.66 % were preterm, 8.74% of the early term, 12.4% were term and 3.11% were late term.

52.81% of these women could read and write while the rest were illiterate.

63.82% were from the rural areas while, 36.17% were from the urban areas.

On classifying the still births as per the ReCoDe classification system

The major cause of still birth was found to be foetal growth restriction (42.61%) followed by hypertensive disorders of pregnancy (20.58%). 7.9% of the still birth cases were attributed to obstetric cholestasis. Intrapartum foetal asphyxia was identified as the cause of still birth in 4.36 % women while maternal diabetes in 3.11% of the total women. Oligohydramnios was the only identifiable cause in 2.9 % of the women while polyhydramnios co-existed in 0.41%. Stillbirth was attributed to lethal congenital anomaly in foetus in 1.24% women. Antepartum haemorrhage contributed to 2.9 % in which 1.6% women had coexisting abruption placentae and 0.8 % had placenta previa. Cause of still birth remained unidentified in 10.39% women. 4 women (0.83%) had presented to us with cord prolapse along with IUD, 1.66 % of these were referred as uterine rupture along with intra uterine foetal demise.0.83% women had long standing chronic illness leading to intrauterine foetal demise.

DISCUSSION

Classification of stillbirths helps in an objective analysis of the major risk factors that are prevalent in a particular community or in a particular geographical area. Since times immemorial various classification systems have been used for stillbirth classification but their major drawback was that the cause of a large proportion of stillbirths remained unidentified. Now a days ReCoDe classification system is being used for classification of the causes of the still births. The ReCoDe system

systematically classifies the causes of stillbirths starting from factors being attributed to the foetus, the umblical cord, the placenta, the amniotic fluid, factors pertaining to the uterus, comorbidities in the mother, intrapartum factors like birth asphyxia and trauma and then external or iatrogenic trauma. The last group includes the unclassified cases. It tries to cover almost every cause that can lead to the foetal demise.

Age wise classification showed that 61.75% of all the women were found to be in the age group of 25-35 years followed by 31.42% women who were less than 25 years of age. These findings are similar to the study done by Juhi Shah et al [8] in the year 2023 in which half of the study population was in the age group of 26-35 years followed by women who were less than 25 years of age. In another study from India [9], maternal age less than 25 years was found to be associated with an increased odds of having a stillbirth delivery. Early marriage and childbirth have profound adverse impact on the physical and mental health of young women which gets further compounded by such adverse perinatal outcomes.

40.33 % of all the women who had a stillbirth delivery were multipara. These findings are also similar to the other studies reported from India. [8][9]

75.67% of all the stillborn babies in our study were found to be pre-term. In this, 34.30 % were very early pre-term, 22.45% were early pre-term and 18.9% were late pre-term. Another study from India also reported a preponderance of preterm deliveries among stillbirth deliveries. [8]

Of the 481 stillbirth deliveries, 429 women delivered vaginally whereas 52 women underwent either lower segment caesarean section or hysterectomy. These included women with a history of previous 2 lower segment caesarean sections or those who had come to us with rupture uterus.

Jason Gardosi et al [10] conducted a study in the West Midlands region in England, and concluded that the major cause of still births was identified as foetal growth restriction i.e. 43%. In another study conducted by Urooj Kashif et al [11] in Pakistan, foetal cause was found in 34.7% cases and foetal growth restriction was the most common cause in that. In this particular study also on applying the ReCoDe classification system, the most common cause identified was foetal growth restriction .i.e. 42.61%. In another study reported by Neeraj Kulkarni et al [12] from India, majority of cases were due to foetal growth restriction, hypertensive disorders of pregnancy and uteroplacental insufficiency. It has been noted that foetal growth restriction is one of the most important causes of stillbirths all over the world**.** Hence, it is extremely essential to have regular antenatal checkups during pregnancy. Timely intervention may lead to significant decline in stillbirth rate due to foetal growth restriction.

Second leading cause of stillbirths in our study was found to be hypertensive disorders of pregnancy. Hypertensive disorders of pregnancy were identified in 20.58% of the mothers who suffered stillbirth deliveries. In this cohort, 12 women had antepartum eclampsia with intrauterine foetal demise, 57 women had severe pre-eclampsia with features of HELLP syndrome and 30 women had chronic hypertension. Similar results were seen in the study done by Kulkarni et al [12] reporting 25.5% of all the stillbirth deliveries due to hypertensive disorders of pregnancy. Also, in a study reported from China, the stillbirth rate in women with hypertensive disorders of pregnancy was found to be 21.9% [13]. It is worth noting here that some studies have reported hypertensive disorders of pregnancy as the leading cause of stillbirths among women. In a study done by Anju Gupta et al [14] hypertensive disorders of pregnancy were reported to be the most significant factor related to stillbirths and was identified as the cause in 31.71% women. Ami Yagnik et al [15] also conducted a study to classify stillbirths according to the ReCoDe system and reported foetal growth restriction in 28% women and hypertensive disorders of pregnancy in 22 % women. Hypertensive disorders of pregnancy are one of the most important obstetrical causes of maternal mortality and morbidity. These studies implicate their significant role in perinatal mortality as well. They often present along with foetal

distress, oligohydramnios and foetal growth restriction along with uteroplacental insufficiency of varying degrees. From the above findings it may be concluded that the two major causes of perinatal mortality are foetal growth restriction and hypertensive disorders of pregnancy and their adverse outcomes can be prevented by simple measures like obstetrical examination and measurement of blood pressure at every antenatal visit.

Another major maternal factor responsible for still births was found to be obstetric cholestasis in this study. 7.9% of all the stillbirth deliveries were attributed to intrahepatic cholestasis of pregnancy. In a study by Miriam L et al [16] intrahepatic cholestasis of pregnancy was found to have 4 to 10 fold increased risk of cholestasis. Intrahepatic cholestasis of pregnancy has been known to cause meconium stained liquor, foetal distress and sudden intrauterine foetal demise and it often goes undiagnosed.

4.36% women were identified to have birth asphyxia and intra-partum loss in this particular study. This group included 6 women who had come with foetal distress with obstructed labour, 5 women had foetal distress in active phase of labour and 10 women had foetal distress with severe FGR.

Of the total cohort, 3.3 % women had causes attributable to liquor amnii. Out of these 87.8% women had associated oligohydramnios, while polyhydramnios was associated with 12.12% women as an isolated finding. Juhi Shah et al [8] reported 19.6% association with oligohydramnios. Abnormalities in liquour in the third trimester of pregnancy may be associated with congenital anomalies in the foetus as well. Not all women undergo Level II scan in the second trimester of pregnancy. Hence, congenital anomalies may co-exist in some of these women. Further work-up is needed in the form of foetal autopsy, histopathological examination of the placenta with cord and chromosomal analysis.

2.9 % women had placental causes. Among the placental causes 57.24 % had abruption placentae and 42.85% were associated with placenta previa.

8 women had uterine rupture along-with intra-uterine foetal demise. These women had history of previous caesarean delivery and ended up in rupture uterus when they went into labour. Strict foeto-maternal surveillance and timely intervention must be done in women with previous caesarean deliveries.

3.11% of the total cohort were identified to have gestational diabetes mellitus. Similar data was reported by Juhi Shah et al [8].

In 0.831%women other maternal conditions such as heart disease, anaemia and jaundice were identified. 2 women had severe anaemia with congestive heart failure, one had severe mitral stenosis with pulmonary oedema and one woman had severe jaundice. As per a recent study done by Iffat Ara Talin et al [17] anaemia still affects 50% of the pregnant women in India. The odds of stillbirth among pregnant women and perinatal death were five times higher as compared to women with normal haemoglobin levels [18].

In 1.24% women lethal congenital anomalies in the foetus were identified. 1 woman had non-immune hydrops. The antenatal ultrasound findings were suggestive of hydrops fetalis and these findings were confirmed upon delivery of the baby. 4 women presented to us with cord prolapse in labour.3 out of these were with transverse lie and one was in cephalic presentation with free floating head. They had come to us as a referred case from peripheral health facilities and suffered cord prolapse and intra uterine foetal demise on the way during transport. Transverse lie is easily identifiable on physical examination as well as on ultrasonography. Hence, such pregnancies should be booked only at a centre that is equipped with 24 hour caesarean section facility so that such

complications may be avoided. Transverse lie in labour if not managed immediately and optimally can even lead onto grave complications like rupture uterus endangering the maternal life as well. Hence simple measures like timely referral of the pregnant woman can save the maternal as well as the foetal life.

10.39 % cases remained unidentified. Efforts were made to identify the cause of stillbirth in each case on the basis of physical examination, ultrasonography and blood investigations. But further, investigation in the form of foetal autopsy and histopathological examination of placenta can further help in deciphering the cause of stillbirth in some of these unexplained causes.

Age (years)	Number of women
< 25	180
25-35	297
>35	4

Table 1. Age wise classification

Period of Gestation (weeks)	Number of women
28-32	165
32-33 weeks 6 days	108
34-36 weeks 6 days	91
37-38 weeks 6 days	42
39 weeks -40 weeks 6 days	60
41 weeks -41 weeks 6 days	15

Table 2. Period of Gestation

Parity	Number of women
P0	80
P1	72
P2	53
P3	82
P4 and above	194

Table 3 Parity wise classification

ReCoDe Class	Number of women
A1	6
A3	1
A7	205
B1	4
C1	8
C2	6
D2	14
D3	2
E1	8
F1	15
F4	99
F6	38
F8	4

G1	21
I1	50
Ante partum eclampisa	12
Severe pre-eclampsia	57
Chronic hypertension	30

Hypertensive disorders of pregnancy

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