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Still birth classification: Application of relevant condition at death (Recode) classification system in a Tertiary Care Hospital of Peshawar.

Maimoona Qadir[1]

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ABSTRACT… Objective: To find the different causes of stillbirths at our institution, using the ReCoDe categorization system. **Study Design:** Prospective Observational study. **Setting:** Gynae A Unit of Obstetrics and Gynecology Department MTI/ Khyber Teaching Hospital, Peshawar. **Period:** 1st January 2021 to 31st December 2023. **Methods:** Sampling method was consecutive non probability sampling. Patients diagnosed with stillbirth who were admitted to the hospital made up the study population. The patient's highrisk characteristics for pregnancy and delivery as well as the reason for the stillbirth were evaluated. **Results:** During the study period, 210 stillbirth cases in total met the inclusion criteria. There were 32416 live births in all during this time, or six stillbirths for every 1000 live births. The majority of women (80%) with in utero fetal demise fell within the age range of 20 to 35 years old, according to the age distribution of these cases. Thirteen percent of instances involved mothers above the age of twenty, and sixteen percent were older mothers. There were over 45.4% unbooked cases compared to 54.5% booked hospital cases. Fetal causes accounted for 34.6% of intrapartum deaths, with IUGR making up the largest group (23.5%). Maternal factors accounted for 30.4% of stillbirths; pre-eclampsia was the most often reported comorbidity. 18.8% of cases fell into the unclassified category when no other cause could be identified. **Conclusion:** Classification of stillbirths using ReCoDe classification is simple and practical to use, especially in low-resource settings, with the ability to identify underlying cause in the majority of cases.

Key words: Congenital Anomalies, Congenital Heart Disease, Hydrops, ReCoDe, Stillbirth, Preecclampsia.

INTRODUCTION

A stillbirth occurs when a fetus that has outlived its viable age dies intrauterine (IUD).[1] There is considerable variation in the age at which a fetus is deemed viable around the world, even in spite of the WHO criteria for recording stillbirths, which include fetal weight of > 1000 grams, period of gestation of more than or equivalent to 28 weeks, or when the fetal length is more than or equivalent to 35 cm.[2] This is due to the fact that the The existence of skilled labor attendants, growing knowledge of recognized maternal stillbirth risks, and the availability and utilization of prenatal care are all critical elements in deciding the viability of the fetus. Thus, the age of viability in the United States is 20 weeks.[3] As per the UN Inter-Agency Group for Child Mortality Estimation (UN-IGME)'s inaugural study on stillbirths, titled A Neglected Tragedy: The Global Burden of Stillbirths, one stillbirth (SB) occurs every 16 seconds, which translates to around two million SBs annually.[4] One's social, psychological, financial, and physical well-being are all negatively impacted by these losses.[5] Miscommunications between parents and medical staff that result in medical malpractice lawsuits may also be discovered by SBs.[6]

Because SBs can have unintended negative effects on families, they are costly for all countries. There are two main reasons to understand the cause of stillbirths. Above all, it is essential to give families up-to-date information for their ongoing care. Second, determining the reason accurately is essential. Therefore, the origin of SBs should be correctly determined by medical specialists, notably clinicians, obstetricians, and pathologists.

1. MBBS, FCPS, CHPE, CHR, Assistant Professor Gynae, Khyber Teaching Hospital, Peshawar.

Correspondence Address:
Dr. Maimoona Qadir
Department of Gynae
Khyber Teaching Hospital, Peshawar.
dr.maimoona1983@gmail.com

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Because of the intrinsic complexity of maternal and fetal pathophysiology, identifying the origins of SBs in clinical and pathological situations can be difficult. Determining the precise cause of death may provide challenges.[7]

The fact that medical practitioners classify SB causes using a range of categorization techniques adds complexity to this issue. It is challenging to reliably collect data and compare individuals from different geographic locations because to the scientific literature's ongoing development of SB categorization methodologies.[8]

The ReCoDe categorization system is employed to group different causes of stillbirth and the risk factors that are related to it. This categorization system is one of the few created with the express purpose of determining the causes of fetal mortality.[9] The low rate of misidentification of stillbirth cases gives this categorization a significant advantage over the others. By analyzing what went wrong and extracting lessons for optimal therapeutic practice, this method assists clinicians in supporting the counseling of grieving mothers and families with the loss, its underlying causes, and their future possibilities. Prioritizing health care resources and preventative measures also benefits public health experts and commissioners.[10] This method may be used to classify about 85% of stillbirths.

A systematic method for classifying stillbirths does not exist, despite the fact that our institution maintains precise records of data regarding these cases. Consequently, we set out to apply the ReCoDe stillbirth classification technique to identify the reasons at our hospital. This would provide cross-national and cross-national comparisons of our data and help obstetricians better inform their patients about stillbirth reasons.

METHODS

In the Gynae A unit of the obstetrics and gynecology department of our tertiary care facility, a prospective observational research was carried out. January 1, 2021, to December 31, 2023, was the study's period. The sample strategy employed was consecutive non-probability sampling. Hospitalized individuals diagnosed with stillbirth made up the study population. A review was conducted of the patient's high-risk pregnancy and delivery features in addition to the reason for the loss.

Individuals whose informed consent to participate in the study was obtained; individuals whose fetal death was confirmed by ultrasound and clinical means after 28 weeks of gestation. Patients who expressed a desire not to be included in the study's enrollment were excluded from participation.

Information was gathered over a two-year period from the patient's indoor records. The patient received extensive counseling before being enrolled in the study, and their informed permission was only obtained at that point. The features and attributes of the fetus that were investigated included placental, amniotic fluid, and cord abnormalities.

Maternal factors, including age, parity, socioeconomic status, and medical history were recorded.

Data input and analysis were done using SPSS21. We displayed our data using proportions and frequencies for categorical variables. The KTH Ethics Committee's approved the study (1543/EC/KTH-6-6-22).

RESULTS

During the study period, 207 stillbirth cases in total met the inclusion criteria. There were 32413 live births in all during this time, or six stillbirths for every 1000 live births.

Table-I displays basic demographic data. The age distribution of these instances showed that 80 per cent of the women who had in utero fetal death were between the ages of 20 and 35. In thirteen percent of cases, the moms were over twenty years old, and sixteen percent of the mothers were older. Over 45.4% of hospital cases were unbooked, while 54.5% of hospital patients were booked. This suggests a high referral rate to the tertiary care system.

Table-II displays the ReCode classification

system's applicability to stillbirths. Prenatal reasons accounted for 34.7% of stillbirths; the majority of these cases (23.6%) were related to prenatal growth restriction. 30.4% of stillbirths were caused by maternal causes, with pre-eclampsia being the most often reported comorbidity. When no alternative cause could be found, 18.8% of cases were classed as unclassified.

DISCUSSION

The reasons why Pakistani urban populations experience stillbirths have been listed in a number of study publications. Nevertheless, no uniform system for classifying stillbirths is currently in use. In our investigation, we were able to identify the circumstances that existed at the time of stillbirth and may have played a role in the fetal demise by applying a categorization approach.

Variable	n=210 (%)
Age in years	
<20	9 (4)
20-35	167 (80.5)
>35	34 (16)
Gestational age (weeks)	
<28	56 (27)
28-31.6	52 (25)
32-35.6	52 (25.1)
36-39.6	42 (20)
>40	8 (3.9)
Booking	
Booked	113 (53.6)
Un booked	97 (46.4)
Fetal weight (grams)	
<500	19 (9)
500-999	67 (32)
1000-1499	25 (12)
1500-1999	29 (14.0)
2000-2499	28 (13.5)
>2500	39 (18.8)

Table-I. Demographics.

Data are presented as numbers and percentages.

Conditions	n=210 (%)
Fetal causes	**72 (34.7%)**
Congenital anomalies	13 (6.2)
Fetal Hydrops	4 (1.9)
IUGR	50 (23.6)
Infection	2 (0.48)
Single IUGR in twin pregnancy	5 (2.4)
Single IUD in twin pregnancy	5 (2.4)
Rh immunization	3 (0.9)
Umbilical cord Accidents	**1 (0.48%)**
Umbilical Cord entangling	1(0.48)
Placental etiology	**6 (2.8)**
Abruption Placentae	6(2.8)
Amniotic fluid etiology	**9(4.3%)**
Chorioamnionitis	2 (0.9)
Polyhydramnios	1(0.48)
Rupture of membranes	6 (2.8)
Uterine etiology	**6(2.8%)**
Rupture of uterus	6 (2.8)
Maternal etiology	**63(30.4%)**
Diabetes	12 (5.7)
PET	31 (14.9)
APLS	6 (2.8)
Cardiac disorder	1 (0.48)
Sepsis	6 (2.8)
Thyroid abnormalities	2 (0.9)
HELLP	3 (1.4)
Cardiomyopathy	1 (0.48)
Epilepsy	1 (0.48)
Intra partum etiology	**2(0.9)**
Hypoxic Ischemic Encephalopathy	2 (0.9)
Trauma related etiology	**2(0.9%)**
External trauma	2 (0.9)
No cause found	**39 (18.8%)**

Table-II. Relevant condition at death classification

Data are presented as numbers and percentages.

According to the current study's findings, our hospital experienced 6 stillbirths out of every 1000 births during the study period. On the contrary, it was found in studies by Aziz A et al. and McClure EM et al, that Pakistan had a stillbirth rate of 53.5/1000 births and 56.9/1000 births,

respectively.[11,12] Numerous factors contribute to the startlingly high stillbirth rate, including inadequate access to human and material resources, malnutrition, low levels of education among women, a high frequency of premature and LBW babies, and a lack of adequate maternal and neonatal care.[13]

The age group of 20-35 years old made up more than half of the study population. Our findings regarding the most common age range for pregnancy and the resulting stillbirth, are consistent with Indian cultural practices and beliefs that emphasize early marriage and pregnancy. It has been claimed that in India, mothers under 25 years of age had a 29% higher chance of experiencing stillbirths.[14]

As a referral facility, 46 percent patients were referred rather than booked. The reason for this is because the great majority of women lack access to prenatal care.57% of our antenatal population have gone to the required four or more prenatal checkups, according to a recent survey.[15] In the first trimester of pregnancy, there was even less of a need for prenatal care; visits were primarily made to identify high-risk factors and provide appropriate care based on the woman's needs. The main cause of Pakistan's high stillbirth incidence appears to be the failure of these vulnerable women to identify risk factors and receive healthcare throughout their early pregnancies.

We show that maternal causes accounted for 30.4% of all stillbirths in our study, making them the most common cause. Placental and amniotic fluid causes followed with 7%, and they were indicative of the socioeconomic and cultural background. According to the study by Kashif et al., which reported 33.3% of stillbirths, compared to our study, which revealed 16.4% of stillbirths, the primary cause of stillbirth was pregnancy-induced hypertension.[16]

Similar to the findings of Kaur et al.'s study, nearly 70% of the placental reasons were abruptio placenta (mainly related to pregnancy-induced hypertension), with placental previa and other causes of placental insufficiency and anomalies coming in second and third.[17] We report that, in terms of amniotic fluid causes, prelabor rupture of membranes complicated 2.8% of all stillbirths, which is comparable to the findings of a local study.[18]

According to our analysis, 81% of stillbirth cases had their causes determined when the relevant condition at death (ReCoDe) categorization was used; just 19% of cases had no cause identified. Unexplained stillbirth occurs when the reason of the stillbirth cannot be determined by existing diagnostic techniques, when insufficient information is available, or when no obvious etiology could be established. Despite the fact that various categorization systems are being used to aid in determining the etilogy of stillbirth, Gardosi et al. reported various categorization systems and discovered that this system performed well than the others, assigning condition in 85% babies.[19] Similarly, the use of recode in another Indian study led to 87.5% of cases to be classified in relevance with its associated disorder.[20]

Stillbirths in Pakistan are still not widely reported. Furthermore, the absence of any classification system makes it impossible to pinpoint the reason or contributing element that results in stillbirth. ReCoDe classification is simple to use and understand, particularly in environments with limited resources. In the great majority of cases, related causes have been found.

CONCLUSION

As can be seen, we were able to categorize 81% of the cases using the ReCoDe Classification system, leaving 19% of stillbirths unexplained. In our research, the fetal spectrum of illnesses during pregnancy was the most frequent cause of stillbirths. This was followed by a number of other maternal disorders during pregnancy, including hypertension, diabetes, heart disease, etc. And so, the ReCoDe classification system proves to be a useful categorization system that poor nations might implement to help avoid and reduce stillbirths.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Maimoona Qadir:** Data collection, analysis, compilation results.