



Original Research Article

Prevalence and causes of stillbirths at a tertiary care hospital: One year study

Nilesh M Makwana¹, Rajal V Thaker^{1,*}, Shyama B Baranda¹, Aditi A Tyagi¹,
Foram P Patel¹

¹Dept. of Obstetrics and Gynecology, Smt. N.H.L Municipal Medical College, Ahmedabad, Gujarat, India



ARTICLE INFO

Article history:

Received 04-12-2020

Accepted 08-12-2020

Available online 13-03-2021

Keywords:

Stillbirth

Pregnancy

ABSTRACT

Introduction: Stillbirth is a major obstetrical complication and devastating experience for parents as well as obstetricians. Identification of causes of stillbirth will be helpful in counselling of parents as well as formulating preventive measures. Objectives of current study were to study the prevalence, causes of stillbirth and associated complications to suggest preventive measures.

Study Design: This retrospective observational study was carried out from July 2018 to June 2019 at a teaching tertiary care hospital.

Results: Total number of birth during the study period was 6587 and total number of stillbirth was 109, hence prevalence of stillbirth was 16.5 per 1000 total births. Majority of patients 41(37.6%) belonged to maternal age group of 20-24 years of age. Majority of patients 73(67%) were multigravida. Majority 72(66.0%) were emergency admissions. Majority of stillbirth 88(80.7%) were preterm, less than 37 weeks of gestational age. Majority of stillbirth 49(44.9%) were weighted from 1000-1499gram. Majority of stillbirth 65(59.6%) were male. Vaginal delivery occurred in 93(85.3%) and 16(14.7%) required surgical intervention. In 21(19.2%) no identifiable cause of stillbirth was found whereas causes identified in 88(80.8%). Stillbirth occurred in 27(24.8%) cases of hypertensive disorder of pregnancy and 24(22%) patients of anaemia. Other causes of stillbirth were Abruption 9(8.2%), IUGR 9(8.2%), oligohydramnios 5(4.6%) congenital malformation 3(2.8%), fever 3(2.7%), placenta previa 3(2.8%), gestational diabetes 2(1.9%), hypothyroidism 2(1.9%) and uterine rupture in 1(0.9%). DIC occurred in 4(3.6%).

Conclusion: Majority of patients were unregistered and had not taken antenatal care or had inadequate antenatal care. Hypertensive disorders during pregnancy were the leading cause for stillbirth followed by anemia and unexplained causes. A significant proportion of stillbirths can be prevented by health education regarding importance of adequate antenatal care, warning signs and institutional deliveries. Emotional support and counseling of patients and her relatives are very much essential in patients having stillbirth.

© This is an open access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

1. Introduction

The definition of a stillbirth varies across countries. The American College of Obstetricians and Genealogists define fetal demise as the death of a fetus past 20 weeks of gestation and or weight of 500 gms and above.¹ In United Kingdom, stillbirth is defined as delivery of a baby with no signs of life after 24 weeks of Pregnancy.² However for the purpose of statistics for international comparison,

as per World Health Organization (WHO), stillbirth (SB) is the birth of a newborn after 28th completed week and weighing 1000gms or more when the baby does not breathe or show any sign of life after delivery, before onset of labor (antepartum death) or during labor (intra partum death).³ Stillbirth is a significant contributor to perinatal mortality in developing countries and it is a devastating experience for parents as well as obstetricians.

The objectives of this study were to know the prevalence and to identify the causes of stillbirths so that possible preventive measures can be suggested to decrease the rate

* Corresponding author.

E-mail address: drrajalthaker@gmail.com (R. V. Thaker).

of stillbirths.

2. Materials and Methods

This retrospective observational study was carried out from July 2018 to June 2019 at a tertiary care teaching hospital. Case Records were thoroughly analysed with respect to age, parity, history of stillbirth in previous pregnancy, gestational age, associated complicating factors like the hypertensive disorders of pregnancy, diabetes, severe anemia, etc. in addition to details of investigations that were carried out. Fetal characteristics were studied with respect to sex, birth weight and gross congenital anomalies. We have evaluated all cases of stillbirths using Relevant Condition at Death (ReCoDe) classification⁴ system to find out the causes of fetal loss which is a clinically based system appropriate for developing countries where only minimal investigations are possible. Mode of delivery and associated complications were also studied.

2.1. Inclusion criteria

All diagnosed cases of stillbirths of more than 28 weeks or ≥ 1000 gm of weight.

2.2. Exclusion criteria

All abortions and stillbirths of less than 28 weeks/ less than 1000 grams.

3. Results

During the study period, out of 6587 total births, there were 109 stillbirths. Hence prevalence of stillbirths in present study was 16.5 per 1000 total birth.

As shown in Table 1, majority of patients having stillbirths were in age group of 20-24 years (37.7%). The majority of patients having stillbirths were para three or more 57(52.2%). Illiterate patients were 17 (15.6%) whereas 57(52.2%) patients had primary education. Majority of patients were residing in urban area, 92(84.4%) and majority were unregistered patients 72(66%).

As shown, in Table 2, majority of SB 56 (51.4%) occurred between 32-37 weeks of gestational age and 88 (80.7%) were preterm, that is less than 37 weeks of gestational age.

The majority of patients 93(85.3%) delivered vaginally whereas 16(14.7%) required caesarean section.

As shown in Table 3, majority 49(45%) of stillborn fetus weighed from 1000-1499gm. Majority 65(59.6%) were male and 44(40.4%) were female. Only 17(15.6%) were macerated, compared to 92(84.4%) who were non-macerated.

Table 4, shows distribution of stillbirths according to Relevant Condition at Death (ReCoDe) classification. In present study, two most common reasons for stillbirths

Table 1: Demographic characteristics of patients with stillbirth (N = 109)

Characteristics	Stillbirth (Number)	Percentage (%)
Age		
< 20	9	8.2
20-24	41	37.7
25-29	36	33
30-35	22	20.2
> 35	1	0.9
Parity		
Primi	36	33
P2	16	14.7
P3	32	29.3
P4	12	11
\geq P5	13	11.9
Level of Education		
Illiterate	17	15.6
Primary	57	52.2
Secondary	11	10.1
Higher Secondary	16	14.7
Under Graduate	7	6.4
Post Graduate	1	0.9
Area of Residence		
Urban	92	84.4
Rural	17	15.6
Type of Admissions		
Emergency	72	66
Registered	37	34

were hypertensive disorder of pregnancy and anaemia in 27 (24.8%) and 24(22%) of stillbirths respectively. Unexplained cause for stillbirth was found in 21 (19.2%) of patients. Accidental haemorrhage and placenta previa as a placental cause for stillbirths in 9 (8.2%) and placenta previa was seen in 3(2.8%) respectively. Intrauterine growth restriction (IUGR) and congenital anomaly as a fetal cause for stillbirths was present in 9(8.2%) and 3 (2.8%) respectively. Oligoamnions was present in 6 (5.5%) of patients.

4. Discussion

The definition of stillbirth recommended by WHO for international comparison is a baby born with no signs of life at or after 28 weeks gestation.³

In 2015 there were 2.6 million stillbirths globally, with more than 7178 deaths a day. The majority of these deaths occurred in developing countries. Ninety-eight percent occurred in low- and middle-income countries. The stillbirth rate in sub-Saharan Africa is approximately 10 times that of developed countries (29 vs. 3 per 1000 births). Worldwide, the number of stillbirths has declined by 19.4% between 2000 and 2015, representing an annual rate of reduction (ARR) of 2%. This reduction noted for stillbirths is lower than that noted for maternal mortality ratio (AAR=3.0%)

Table 2: Gestational age and mode of delivery in relation to stillbirth (N= 109)

Gestational Age	Mode of Delivery					
			ND		LSCS	
Gestational Age in weeks	Number	Percentage	Number	Percentage	Number	Percentage
28-31	32	29.3	22	20.2	10	9.2
32-37	56	51.4	52	47.7	04	3.7
>=38	21	19.3	19	17.4	02	1.8
Total	109	100	93	85.3	16	14.7

Table 3: Characteristics of baby (N = 109)

Fetal Characteristics	Number	Percentage (%)
Weight		
1000-1499	49	45
1500-1999	23	21.1
2000-2499	16	14.7
2500-2999	16	14.7
3000-3499	3	2.7
>=3500	2	1.8
Sex		
Male	65	59.6
Female	44	40.4
Gross Features		
Macerated	17	15.6
Non-Macerated	92	84.4

Table 4: Distribution of stillbirths according to relevant condition at death (ReCoDe) N=109

	Details	Number	Percentage (%)
Group A: Fetus	IUGR	9	8.2
	Congenital Anomaly	3	2.8
Group B: Umbilical Cord	NIL	-	-
Group C: Placental	Abruption	9	8.2
	Previa	3	2.8
Group D: Amniotic Fluid	Oligohydramnions	5	4.6
Group E: Uterus	Rupture	1	0.9
	Hypertensive Disorders of Pregnancy	27	24.8
Group F: Mother	Anemia	24	22
	Fever	3	2.7
	Gestational diabetes	2	1.9
	Hypothyroidism	2	1.9
Group G: Intrapartum	NIL	-	-
Group H: Trauma	NIL	-	-
Group I Unclassified	Unexplained	21	19.2

and under 5 mortality rate (ARR= 3.9%), for the same period.³

Worldwide in 2015, 18.4 stillbirths per 1000 total births occurred, compared with 24.7 stillbirths in 2000. During the study period, out of 6587 total births, there were 109 stillbirths. Hence, proportion of stillbirths in our study was 16.5 per 1000 total birth. But it was still way above the World Health Assembly (WHA) endorsed target of 12 or fewer in all countries by 2030. Global ARR needs to more than double the present ARR of 2%v to accomplish the target for reduction in stillbirth. The Government of India has developed an Indian Newborn Action Plan that includes efforts to reduce stillbirths to < 10 per 1000 births by 2030.⁵

In present study, 9 (8.2%) patients were of below 20 years of age, 41 (37.7%) patients were between ages of 20-24 years, 36 (33%) were between ages of 25-29 years and elderly patient (>35 years) was 1 (0.9%). Mustufa MA et al⁶ has reported that, stillbirth were common (73.7%) in age group of 20-35 years. Njoku C.O et al⁷ stated that SB is common (33.7%) in age group of 30-34 years. Showghy et al⁸ stated that pregnancy at the age of 16 years and less than 16 years increase the risk of stillbirths by 4 times. Fretts RC et al⁹ has concluded that age of 35 and more can increase risk of foetus death by 1.5 times.

The parity of the patient influences pregnancy outcome. In present study, proportion of stillbirths was higher in multigravida 73(67%). Njoku C.O et al⁷ stated that proportion of stillbirths was higher in multigravida (82.1%)

which is similar to our study whereas Mustufa MA et al⁶ concluded that proportion of stillbirths was higher in primigravida patient (61%).

In present study, illiterate patients were 17 (15.5%) whereas 57(52.2%) patients had primary education. These findings surely point relation of education and health seeking behavior.

In present study, proportion of stillbirth was higher among 72 (66%) emergency admissions compared to 37 (34%) registered admissions. Lack of adequate antenatal care is the most important problem that needs urgent attention. If patient has taken adequate ANC then anemia, hypertensive disorders etc. can be diagnosed at earlier stages and managed. Hence, stillbirth due to these causes can be prevented. It is well-established that adequate ANC is associated with better pregnancy outcome. Al Kadri et al¹⁰ found that women who did not receive ANC are at 70% risk of Stillbirth. The majority of stillbirths are preventable, evidenced by the regional variation across the world. The rates correlate with access to maternal healthcare.³

Prematurity and Intrauterine growth retardation (IUGR) are another risk factors for fetal death. In present study, majority of stillbirth 56 (51.4%) occurred between 32-37 weeks of gestational age and 88 (80.7%) were preterm, that is less than 37 weeks of gestational age. Mustufa MA et al⁶ concluded that proportion of stillbirth was higher (55.47%) between 32-37 weeks of gestational age which is similar to our study.

In present study, majority 49(44.9%) of stillborn fetus weighed from 1000-1499gm. Birth weight is one of the significant factors for an adverse fetal outcome.¹¹

In present study, out of all stillborn babies, 65(59.6%) were male and 44(40.4%) were female. A meta-analysis by Mondal D et al.,¹² which includes data on more than 30 million births, links sex with stillbirth, the risk being about 10% higher in male fetuses. The reason for male preponderance is unclear but may be linked to the difference in male and female development. Male embryos have faster development and higher metabolic rates than female embryos and this potentially leave male fetuses more vulnerable to distress or death from a range of stressors including endocrine fluctuation, oxidative stress and faster nutritional depletion when they encountered stressful conditions.

The ReCoDe system⁴ of classification helped us to identify a cause in 80.8% of stillbirths. In present study, hypertensive disorders of pregnancy was cause of stillbirths in 27(24.8%). Njoku C.O et al⁷ reported 18.9% of stillbirths due to hypertensive disorders. Sharma S et al¹³ concluded that PIH accounted for 19.6% of stillbirths. In PIH, vasospasm decreases blood flow to all organs, particularly uteroplacental perfusion. So oxygen supply to fetus decreases and leads to fetal hypoxia and stillbirth.

In present study, stillbirth occurred due to anemia in 24(22%) compared to 12.2% reported by Njoku C.O et al.⁷ Stillbirth due to Iron deficiency is the most common cause of anaemia in pregnancy and Iron and folic acid supplements are recommended for prevention.¹⁴

In present study, accidental haemorrhage and placenta previa as a placental cause for stillbirths in 9 (8.2%) and in 3(2.8%) respectively. Njoku C.O et al⁷ reported that abruptio placenta and placenta previa accounted for 9.3% and 2.2% cases of stillbirth. Sharma S et al¹³ reported antepartum haemorrhage in 12% as a cause of stillbirth. Antepartum haemorrhage leads to maternal blood loss leading to hypovolemic anaemia, hypoxia, hypertonic uterine contraction causes fetal hypoxia and death.

In present study, congenital malformation in form of neural tube defect leading to stillbirth in 3(2.7%). Njoku C.O et al⁷ reported stillbirth due to congenital malformation in 1% while Sharma S et al¹³ reported stillbirth due to congenital malformation in 8%.

In present study, other maternal conditions like fever, gestational diabetes, hypothyroidism accounted for stillbirth in 03 (2.7%), 02 (1.8%), 02 (1.8%) respectively.

In present study, normal vaginal delivery occurred in 93 (85.3%), while operative procedure was required in 16 (14.7%) cases. Njoku C.O et al⁷ reported that normal vaginal delivery occurred in 74.3% patients of stillbirth while operative procedure was needed in 25.7%.

Most common complication associated with stillbirth was DIC that occurred in 4(3.6%). Thromboplastin released from blood clots damages placenta and dead fetus activates coagulation cascade that leads to DIC. These patients were managed by treatment of underlying condition, maintaining perfusion to vital organs, transfusion of blood and blood components. Availability of multispecialty and intensive care helps in management of these patients. Stillbirth resulted due to uterine rupture in 01 (0.9%) patient who had history of previous two caesarean section.

In present study, unexplained stillbirth occurred in 21 (19.2%). Which is comparable to Njoku C.O et al⁷ (20.8%).

5. Conclusion

Majority of patients were unregistered and had not taken antenatal care or had inadequate antenatal care. The new ReCoDe primary classification system helped us in assigning the probable cause of stillbirth in majority of patients. Hypertensive disorders during pregnancy were the leading cause for stillbirth followed by anaemia and unexplained causes. A significant proportion of stillbirths can be prevented by health education regarding importance of adequate antenatal care, warning signs and institutional deliveries. Adequate antenatal and intra natal care can prevent stillbirths due to modifiable risk factors such as pre-eclampsia, eclampsia, anemia, diabetes etc. Timely reference to higher center is also necessary. Emotional

support and counseling of patients and her relatives are very much essential in patients having stillbirth. In case of unexplained stillbirth, fetal autopsy, placental and membrane examination can be helpful for finding out causes and to plan future pregnancy accordingly.

6. Source of Funding

None.

7. Conflict of interest

None declared.

Acknowledgments

Authors would like to thank Superintendent of SCL Hospital and Dean of Smt. NHL Municipal Medical College in addition to all patients, colleagues and staff of hospital.

References

- American college of obstetricians and gynaecologists. Diagnosis and management of fetal death. ACOG Technical bulletin no 176. *Int J Gynecol Obstet.* 1993;42:291–9.
- Kean L. Intrauterine fetal death. In: Leusley DM, Baker PN, editors. *Obstetrics and gynaecology: An evidence based text for MRCOG.* Oxford; 2004. p. 317–24.
- Available from: https://www.who.int/maternal_child_adolescent/epidemiology/stillbirth/en/.
- Aminu M, Unkels R, Mdegela M, Utz B, Adaji S, Broek NVD. Causes of and factors associated with stillbirth in low - and middle-income countries: a systematic literature review. *BJOG.* 2014;121(4):141–53.
- Sharma D. India newborn action plan. *J Res Med Sci.* 2015;2:58.
- Mustufa MA, Kulsoom S, Sameen I, Moorani KN, Memon AA, Korejo R. Frequency of stillbirths in a Tertiary care hospital of Karachi. *Pak J Med Sci.* 2016;32(1):91–4.
- Njoku CO, Emechebe CI, Eyong EM, Ukaga JT, Anachuna KC. Prevalence and risk factors for stillbirths in a tertiary hospital in Niger Delta area of Nigeria: a ten year review. *Int J Med Biomed Res.* 2016;5(3):106–13. doi:10.14194/ijmbr.5.3.1.
- Showghy S, Millat W. Early teenage marriage and subsequent pregnancy outcome. *East Mediterr Health J.* 2000;6(1):46–53.
- Fretts R. Causes of Fetal Death in Women of Advanced Maternal Age. *Obstet Gynecol.* 1997;89(1):40–5. doi:10.1016/s0029-7844(96)00427-9.
- Al-Kadri HMF, Tamim HM. Factors contributing to intra-uterine fetal death. *Arch Gynecol Obstet.* 2012;286(5):1109–16. doi:10.1007/s00404-012-2426-z.
- Ajini KK, Radha KR, Reena RP. Classification of stillbirths by relevant condition at death (ReCoDe): a cross sectional study at a rural tertiary care centre in Kerala, India. *Int J Reprod Contracept Obstet Gynecol.* 2017;6(3):1061. doi:10.18203/2320-1770.ijrcog20170585.
- Mondal D, Galloway TS, Bailey TC, Mathews F. Elevated risk of stillbirth in males: systematic review and meta-analysis of more than 30 million births. *BMC Med.* 2014;12(1):220. doi:10.1186/s12916-014-0220-4.
- Sharma S, Sidhu H, Kaur S. Analytical study of intrauterine fetal death cases and associated maternal conditions. *Int J Appl Basic Med Res.* 2016;6(1):11. doi:10.4103/2229-516x.173986.
- Sinha D, Shrivastava S. Prevalence of anemia during pregnancy and its association with adverse perinatal outcomes in Madhya Pradesh, India. *Int J Reprod Contracept Obstet Gynecol.* 2019;8(3):845–8. doi:10.18203/2320-1770.ijrcog20190494.

Author biography

Nilesh M Makwana, 3rd Year Resident

Rajal V Thaker, Professor

Shyama B Baranda, 3rd Year Resident

Aditi A Tyagi, 2nd Year Resident

Foram P Patel, 2nd Year Resident

Cite this article: Makwana NM, Thaker RV, Baranda SB, Tyagi AA, Patel FP. Prevalence and causes of stillbirths at a tertiary care hospital: One year study. *Indian J Obstet Gynecol Res* 2021;8(1):61-65.