Prevalence of Stillbirth and its Associated Antepartum Risk Factors

Simrat Kaur[1], B. R. Bhagat[2], Radhika Gupta[3], Shashi Gupta[4]

[1]Department of Obstetrics and Gynecology, GMC Jammu, J&K, India, 148 A/D Gandhi Nagar , Jammu , J&K, India 180001

[2]Department of Obstetrics and Gynecology, GMC Jammu, J&K, India, H.no 59, Priyadarshani lane, Patta, Paloura, Jammu , J&K, India 180002

[3] Department of Obstetrics and Gynecology, GMC Jammu, J&K, India, 204, Sec-1A,South Extension, Trikuta Nagar, Jammu , J&K, India 180001

[4]Department of Obstetrics and Gynecology, GMC Jammu, J&K, India, 202-203, Shastri Nagar , Jammu , J&K, India 180001

Abstract: *The aim of perinatal care is to achieve a safe delivery of a healthy baby and good maternal care. The proportion of intrapartum stillbirths can be substantially declined with improved obstetric care; however, the number of antepartum stillbirths remains high due to an incomplete understanding of the risk factors.* <u>*Methods:*</u> *This was an observational prospective study conducted in the Department of Obstetrics and Gynecology, S.M.G.S. Hospital, Jammu over a period of one year i.e. from September 2017 to August 2018 after approval from the Hospital Ethical Committee. Subjects were patients coming to the hospital with documented IUD and patients with stillbirth occurring during the hospital stay, with gestational age>22 weeks and birth weight >500gm.* <u>*Results:*</u> *We observed that a total of 22,723 deliveries occurred in the hospital out of which 800 were stillbirths; stillbirth rate was found to be 35.20 per 1000 births. The mean age of patients was 26.57±4.65years. Majority of the patients in the study were primigravida (43.13%). Maximum number of patients (66.5%) had antenatal risk factors.* <u>*Conclusion:*</u> *Our study showed that the majority of risk factors associated with stillbirth are antepartum with hypertensive disorders (16.44%) being the most common risk factor followed by anemia (12.54%).*

Keywords: stillbirth, IUD, antepartum, risk factors

1. Introduction

The aim of perinatal care is to achieve a safe delivery of a healthy baby and good maternal care. Although the last 50 years have seen dramatic improvements in social welfare and maternity care, still a proportion of women suffer the loss of their baby. Delivery of a stillbirth fetus is a major source of depression to the mother, her family and the managing obstetrician. WHO reported that in 2015 there were 2.6 million stillbirths globally, this accounts for over 7178 deaths per day (18.4 stillbirths per 1000 total births).

The majority of these deaths occurred in developing countries.

2. Literature Survey

Among the total number of antepartum stillbirths that took place globally in 2009, 470,000 (32 %) took place in South Asia. There are several risk factors which have been associated with antepartum stillbirth; extremes of maternal age, low maternal educational status, lack of antenatal care attendance, chronic maternal medical conditions, pre-eclampsia or placenta abruption during pregnancy, intra-uterine growth restriction, major congenital anomaly of the infant, and poor maternal nutritional status . A population-based cohort study in rural Ghana (a lower-middle-income country) found an association of antepartum stillbirth with previous stillbirth, increasing maternal age (>35 years), primiparity, multiple pregnancies and no antenatal care attendance [1].

3. Methods

This was an observational prospective study conducted in the Post Graduate Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, Jammu over a period of one year i.e. from September 2017 to August 2018 after approval from the Hospital Ethical Committee. Subjects were patients coming to the hospital with documented IUD and patients with stillbirth occurring during the hospital stay, with gestational age>22 weeks and birth weight >500gm. a thorough history of the patient and a gross examination of the delivered baby was done.

4. Results

In our study during the one year, we observed that a total of 22,723 deliveries occurred in the hospital out of which 800 were stillbirths; stillbirth rate was found to be 35.20 per 1000 births.

Table 1: In the present study, we observed that our patients varied between 18-45 years, making a mean age of 26.5 years. The maximum number of patients 359 (44.88%) fell into the 20-25 years of age.

Table no.2: We observed that maximum patients i.e. 305 (38.12%) were primigravida. 228(28.50%) were observed to be second gravida whereas third gravida were 130(16.25%) . 70(8.75%) and 67(8.37%)   were fourth gravida and above respectively.

Table no.3: In our study majority of patients i.e.36 %(288) had gestational age between 36 to<40 weeks, 23.50% (188) had gestational age of 32 to<36 weeks. A cumulative 35.25% (282) patients were of <32 weeks gestational age and only 5.25 %(42) patients were postdated.

Table no.4: It was observed that the majority of patients 418(52.25%) resided in the rural area while 382(47.75%) patients were residing in urban areas.

Table no.5: We observed that 235(29.38%) patients were illiterate, while 71 (8.88%) and 211(26.38%) had education till 5th and 10th standards respectively.226 (28.25%) patients were educated till 12th standard and only 57(7.13%) were graduates and above.

Table no.6: The vast majority of patients, 696(87%), were not booked in our hospital and were either referred to our tertiary center or reported to us directly from home. Only 83(10.38%) patients were booked cases of our hospital.

Table no.7: While analyzing the socio economic status of the patients (according to B G Prasad scale) 455 out of 800(56.88%) patients belonged to middle class group while 19.88% belonged to lower class and lower middle class combined. About 133 (16.63%) belonged to the upper middle class while a relatively small percentage of patients 53 (6.63%) were from upper class.

Table no 8:The presence (or absence) of the fetal heart sound at the time of admission were taken into account and 675 (84.38%) women had absent fetal heart sounds as documented on USG and only125(15.63%) had a live fetus on admission.

Table no.9: The majority of patients had hypertension (16.44%) followed by anemia (12.54%) and congenital anomalies (10.48%). Intrauterine growth restriction (IUGR)(9.15%) was another major contributor and 31.37% patients had more than one risk factors.

Table 1: Age distribution of patients

Age(years)	No.	Percentage (%)
<20	21	2.63
20-25	359	44.88
26-30	299	37.38
31-35	83	10.38
>35	38	4.75
Total	800	

Table 2: Gravidity of patients

Gravidity	No.	Percentage (%)
1	305	38.12
2	228	28.5
3	130	16.25
4	70	8.75
5 or more	67	8.37
TOTAL	800	

Table 3: Distribution of patients according to gestational age

Gestational age (in weeks)	No.	Percentage (%)
22-<28	122	15.25
28-<32	160	20.00
32-<36	188	23.50
36-<40	288	36.00
40 or more	42	5.25
Total	800	

Table 4: Residence

Residence	No.	Percentage (%)
Urban	382	47.75
Rural	418	52.25
Total	800	

Table 5: Educational status

Education	No.	Percentage (%)
Illiterate	235	29.38
Primary	71	8.88
Upto 10th	211	26.38
10th -12th	226	28.25
Graduate and above	57	7.13
Total	800	

Table 6: Booking status

Booking status	No.	Percentage (%)
Booked in SMGS	83	10.38
Booked elsewhere	696	87.00
No ANC	21	2.62
Total	800	

Table 7: Socio-economic status

S-E status	No.	Percentage (%)
Lower class	15	1.88
Lower middle class	144	18.00
Middle class	455	56.88
Upper middle class	133	16.63
Upper class	53	6.63
Total	800	

(According to B.G. Prasad scale)

Table 8: Fetal status on admission

Fetal status	No.	Percentage (%)
IUD	675	84.38
Live fetus	125	15.63
Total	800	

Table 9: Risk factors associated with stillbirth in study patients

Risk factors	No.	Percentage (%)
H/O first trimester bleed	13	1.34
GCA	102	10.48
Hypertension	160	16.44
Anemia	122	12.54
GDM	29	2.98
Cholestasis	61	6.27
Multiple gestation	54	5.55
IUGR	89	9.15
Oligohydramnios	49	5.04
H/O previous stillbirth	73	9.13
H/O trauma	7	0.72
Other medical conditions	19	1.95
No risk factor	112	14
Intrapartum risk factors	292	36.41

5. Discussion

Stillbirth rate is the death of fetus occurring during one year per every 1000 total births (live births plus stillbirths).The definition recommended by WHO (2015) for international comparison is a baby born with no signs of life at or after 28 weeks' gestation. WHO/ICD (International Classification of Diseases) for general statistics and registration defines stillbirths as the death of a fetus that has reached a birth weight of 500 g, or if birth weight is unavailable, gestational age of 22 weeks or crown-to-heel length of 25 cm. Within this category, ICD classifies late fetal deaths (greater than 1000 g or after 28 weeks) and early fetal deaths (500–1000 g or 22–28 weeks).

Stillbirth rate was found to be 35.20 per 1000 births in our study.

The maximum number of patients 359 (44.88%) fell into the 20-25 years of age group which is comparable to the results found by Rai et al(2018)[2] and Lakshmi et al(2017)[3]. However, in some foreign studies like Njoku et al(2016)[4] and Chuwa et al(2017)[5] the majority of stillbirths occurred in the 30-34 years , and 25-35 years age groups respectively. This can be attributed to the early age of marriage and first child birth in India.

In our study like the studies by Lakshmi et al(2017)[3] and Saleem et al(2018) [6] the maximum number of stillbirths occurred in primigravida.

While comparing our study with other studies, it was found that the results were in accordance to the non-interventional prospective study by Jindal et al (2018)[7] in which 67.07% (n=94) patients were from the rural area.The educational status of our patients is in accordance to the retrospective analysis by Rai et al(2018)[2] in which 56% of the patients had primary or no formal education .

Only 83(10.38%) patients were booked cases of our hospital. This shows similar results as a study by Garg et al (2017) [8] in which 88.75%(n=80)cases were unregistered. This can be explained by the fact that majority of patients reside in the rural areas and are booked in their respective peripheral health care centers. Also there was a section of patients with no prior antenatal check-ups.

Hypertension is a causative factor for IUGR, oligohydramnios and antepartum or intrapartum asphyxia which leads to stillbirth. In this study we observed that 160 patients (16.44%) had hypertension as the major risk factor (26 patients had eclampsia). In an article by Newtonraj et al (2017)[9] of a Chandigarh based prospective multi agency study ,18.2%(n=181) patients had hypertension. Further emphasizing the association of hypertension with stillbirths, the prospective study by Lakshmi et al(2017)[3] in Government Medical College, Trivandrum, demonstrated upto 47%(n=100) prevalence of hypertension among the cases of stillbirth.

Anemia was found to be another important risk factor, its effect on the fetus depends on the severity and moderate anemia before 28 weeks has been associated with an increased risk of stillbirth. In our study, anemia occurred in about 122 patients (12.54%). 6 (0.75%) patients had very severe anemia (hb <4), 65 (8.13%) patients had severe anemia(hb 4-6.9). In a prospective, observational, community-based study by Suryanarayana et al (2017)[10] in Kolar Karnataka about 62.3% (n=446)pregnant women were suffering from anemia which led to other obstetrical complications as well.

The third commonest risk factor for stillbirth was presence of a gross congenital anomaly and accounted for 102 (10.48%) patients. Among these anencephaly was the most frequently observed (26.26%) followed by hydrops (22.22%) and hydrocephalus(18.18%). In the study by Jindal et al(2017) [7] in Indira Gandhi Medical College, Shimla, Himachal Pradesh 12.7%(n=94)stillbirths had congenital anomalies. The high percentage in our study can be explained by the majority of patients population being from the rural area and not booked at a tertiary center which in turn reduces access to reliable sonography reporting.

The next important risk factor for stillbirth is IUGR in the antepartum period. We observed in our study it accounts for about 89(9.15%) patients. Rai et al(2018)[2] in Manipal Institute of Medical Sciences ,Sikkim also made the observation of IUGR being the cause of early neonatal death in 6.7% babies , hence emphasizing the increase in perinatal mortality due to growth restriction.

Lamont et al(2015) [11]in a systemic review and meta-analysis (n=3,412,079) observed that women with previous history of stillbirth had almost five times more likely to experience a stillbirth in their second pregnancy (odds ratio 4.77, 95% confidence interval 3.70 to 6.15). In our study we observed that 73(9.13%) patients had a history of a previous stillbirth. So we can conclude that history of previous stillbirth is associated with a high risk of stillbirth in the subsequent pregnancy.

Oligohydramnios was also amongst the high risk factors of stillbirth, accounting for 5.04% of the patients. Cholestasis of pregnancy also contributed to being a risk factor in about 6.27% patients independently as well as in conjunction with other risk factors. In our study multiple gestation accounted for about 5.55% of total risk factors of stillbirth, also adding to other risk factors like prematurity, hypertension etc. In the retrospective cohort analysis by Russo et al(2013)[12] in Monza, Italy it was observed that the risk of stillbirth is significantly higher both in MCDA and DCDA twins compared with singletons.

GDM accounted for about 2.98% of the total risk factors with most the patients having uncontrolled GDM or previously undiagnosed. Also other maternal medical conditions such as T2DM, vasculitis, tuberculosis, septicemia, pneumonia, pancreatitis accounted for 1.95% of all the patients. This correlates with the observations by Newtonraj et al(2017)[9] of a Chandigarh based prospective multi agency study , in which maternal diabetes accounted for 1.7% , maternal infections for 1% and pre-existing maternal medical conditions for 3% of the causes of stillbirth(n=181).

In our study we also have 1.34% of patients with a history of first trimester bleed of varying degrees. 1.95% patients had other medical conditions such as tuberculosis, vasculitis , pyrexia of unexplained origin etc. a small percentage of people reported with antenatal trauma majorly in a road traffic accident (0.72%).

251 out of 800(31.37%) patients had more than one risk factors. Lastly, we observed that in 14% patients no apparent risk factor could be found, antepartum or intrapartum.

6. Conclusion

It is worrisome that India has such a high global burden of stillbirths, a major reason that stillbirth has gone unnoticed as a public health issue is its lack of recognition at a policy or community level. Our study showed that the majority of risk factors associated with stillbirth are antenatal and can be prevented. It provides a reason to promote frequent antenatal visits and a better overall health status of the mother. The high stillbirth prevalence may be decreased by encouraging all antenatal women to attend ANC clinics so that those with high risk factors can be identified earlier and have better monitoring of labour. Also, women should be counseled about the prognosis in case of presence of risk factors and importance of compliance to the required treatment.

References

[1] Ha YP, Hurt LS, Tawiah-Agyemang C, Kirkwood BR, Edmond KM. Effect of socioeconomic deprivation and health service utilisation on antepartum and intrapartum stillbirth: population cohort study from rural Ghana. PLoS One. 2012;7(7):e39050.

[2] Rai C, Kharka LV, Dutta S, Kumar N. A retrospective analysis of the risk factors leading to perinatal mortality at a tertiary care hospital of Sikkim, India. Int J Reprod Contracept Obstet Gynecol 2018;7:2295-8.

[3] Lakshmi ST, Thankam U, Jagadhamma P, Ushakumari A, Chellamma N, Hariharan SV. Risk factors for still birth: a hospital based case control study. Int J Reprod Contracept Obstet Gynecol 2017;6:970-4.

[4] Njoku et al.: Prevalence and risk factors for stillbirths. Int J Med Biomed Res 2016;5(3):106-13.

[5] Chuwa FS, Mwanamsangu AH, Brown BG, Msuya SE, Senkoro EE, Mnali OP, et al. (2017) Maternal and fetal risk factors for stillbirth in Northern Tanzania: A registry-based retrospective cohort study. PLoS ONE 12(8): e0182250.

[6] Saleem et al. Reproductive Health 2018, 15(Suppl 1):100.

[7] Jindal A, Thakur R, Minhas S. Causes of stillbirth according to different gestational ages. Int J Reprod Contracept Obstet Gynecol 2018;7:1029-34.

[8] Garg S, Kumar N. Analysis of factors responsible for intrauterine fetal death in rural pregnant women at tertiary care centre of Northern India. Int J Reprod Contracept Obstet Gynecol 2017;6:4071-4.

[9] Newtonraj A, Kaur M, Gupta M, et al. Level, causes, and risk factors of stillbirth: a population-based case control study from Chandigarh, India. BMC Pregnancy Childbirth. 2017; 17(1):371.

[10] Suryanarayana R, Chandrappa M, Santhuram AN, Prathima S, Sheela S R. Prospective study on prevalence of anemia of pregnant women and its outcome: A community based study. J Family Med Prim Care 2017;6:739-43

[11] Lamont Kathleen, Scott Neil W, Jones Gareth T, Bhattacharya Sohinee. Risk of recurrent stillbirth: systematic review and meta-analysis BMJ 2015; 350 :h3080

[12] Stillbirths in singletons, dichorionic and monochorionic twins: a comparison of risks and causes. Russo, Francesca M. et al. European Journal of Obstetrics and Gynecology and Reproductive Biology , Volume 170 , Issue 1 , 131 – 136

ABOUT THE AUTHORS

Dr. Simrat Kaur
Junior Resident
Department of Obstetrics & Gynecology
GMC Jammu , J&K , India

Dr. B. R. Bhagat
Assistant Professor
Department of Obstetrics & Gynecology
GMC Jammu , J&K , India

Jun

Dr. Radhika Gupta
Junior Resident
Department of Obstetrics & Gynecology
GMC Jammu , J&K , India

Dr. Shashi Gupta
Professor and Head(Retd)
Department of Obstetrics & Gynecology
GMC Jammu , J&K , India