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Research Article

Prospective Community-based Study of Still Births in Remote Villages with Low Resources

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Abstract

Background: Stillbirth (SB), either because of intrauterine or intrapartum fetal death, is amongst the most devastating pregnancy complications, hardest to predict, real challenge for health systems. India probably accounts for the highest SB numbers in the world.

Objectives: A community-based prospective study was carried out to know the burden, and causes of SBs in rural women of remote region.

Material methods: After approval of the ethics committee of the Institute in Maharashtra for broader research, which was service-oriented, the present study was conducted in 100 villages around the village with health facilities. These villages were included keeping in mind future services. After obtaining the consent of women, information was prospectively recorded on their predesigned tool (which was for broader work), by asking women and seeing their records of antenatal and intranatal care on a regular basis. The study subjects were selected after obtaining information from nurse midwives, Accredited Social Health Activists (ASHAs), and Aaganwadi workers. As the plan was to serve, there was excellent cooperation. The tool was made for broader work. Villages were visited 5 days a week. Study was community-based in villages in remote, hilly region with various local issues so any information the women gave conclusion and was in the record was used.

Results: A total of 3905 births occurred over two years, 3635 (93%) term, and 270 (7%) preterm. Amongst 3635 term births, 3474 (95.6%) were live births, 161 (4.4%) SBs, amongst 270 preterm births, 239 (88.5%) were live births, 31 (11.5%) SBs. Of 192 SBs, 48 (7.2%) SBs were amongst 2690 women with anaemia, (16 (2.4%) SBs amongst women with very severe anaemia, 12 (1.8%) SBs were amongst 667 women with severe anaemia, 12 (1.8%) SBs were amongst 664 women with moderate anaemia, 8 (1.2%) SBs were amongst 680 women with mild anaemia). Overall of 192 (4.9%) SBs, 31 (18.1%) SBs were among 517 women with hypertensive disorders of pregnancy (HDsP) 8 (4.4%) SBs amongst 280 women with moderate HDsP, 12 (6.9%) SBs amongst 175 women with severe HDsP, 11 (6.8%) SBs in 62 women with eclampsia. Overall of 192 SBs, 6 (3.1%) babies had weight < 1 kg, 8 (4.1%) of ≥ 1 to < 1.5 kg, 50 (26.0%) ≥ 1.5 to < 2 kg, 64 (33.3%) ≥ 2 to < 2.5 kg, 64 (33.3%) 2.5 kg and more, obviously fewer babies more deaths in birth weight less than 1. 5 kg, more so less than 1 kg.

Conclusion: Overall SBs were in women with disorders but 4.5% SBs did occur in women with no disorder. SBs were significantly higher amongst babies weighing less than 1 kg, beyond this weight, numbers were similar.

More Information

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Keywords: Stillbirths; Causes; Weight; Variables; Disorders

Background

Stillbirth (SB), a baby born after the period of viability without signs of life, is a major public health concern globally, more so in developing countries. SB may be the end result of intrauterine fetal death or intrapartum fetal death. Ghumare, et al. [1] opined that India accounted for the highest SB rate (SBs per thousand births) in the world. The occurrence of SBs continues to be a big challenge to health systems around the world. Blencowe, et al. [2] reported that around 2.6 million (2.4 - 3.0 million) SBs occurred globally. SBs at 28 weeks of pregnancy have been reported to be more than 7178/day and represent a large burden for women, families, communities, and healthcare providers. SB is one of the most devastating pregnancy complications and is also one of the hardest to predict. Sergi, et al. [3] after Pubmed search of data of decades, opined that despite the profound impact of SBs, this issue has received much less attention on the global health agenda and is much less explored. There are not many community-based studies about SBs in rural women, especially rural women who live in extreme poverty.

Objective

The present study was carried out to know the burden and obvious causes of SB amongst women of remote villages.

Material and methods

The present study was conducted in 100 villages around the village with health facilities. These villages were included keeping in mind future services. After obtaining the consent of women, information was prospectively recorded on their own predesigned tool (which was for broader work), by asking women and seeing their records of antenatal and intranatal care on a regular basis. Women became study subjects after getting information from nurse midwives, Accredited Social Health Activists (ASHAs), and Aaganwadi workers. As the plan was to serve, there was excellent cooperation. The tool was made for broader work. Villages were visited 5 days a week. The study was community-based in villages in remote, hilly regions with various local issues, so whatever women told and whatever was on record was used.

Study setting

The study was conducted in 100 villages around the village with a health facility (study centre). These villages were selected keeping in mind future services.

Study design: Observational cross-sectional study.

Study period: Two years

Sample size: As all the births in study villages were included, except a few who migrated, sample size calculation was not done.

Inclusion criteria

Women of 15 years - 39 years in whom births occurred over 2 years in the study villages. The plan was to include women of 15 years - 45 years who had births but the eldest was 39 years old.

Statistical analysis

The information was statistically analyzed, using Statistical Package for the Social Sciences software. A comparison was done using the chi-square test and a *p* - value less than 0.05 was considered statistically significant.

Results

A total of 3905 births occurred in the villages over two years, 3635 were term births and 270 preterm (PT) births (7%). Overall 3713 (95.0% of 3905) were live births and 192 (4.9% of 3905) stillbirths (SBs). Amongst 3635 term births, 3474 (95.6%) were LBs and 161 (4.4%) SBs. Amongst 270 preterm births, 239 (88.5%) were LBs and 31 (11.5%) SBs, a statistically significant difference between term and preterm (*p* - value 0.0001). Of 1200 (30.7%) women of 15 to < 20 years of age, 1133 (94.5%) had LBs and 67 (5.5%) SBs. Amongst 1104 term births, 1044 (94.6%) were LBs and 60 (5.4%) SBs, of 96 preterm births, 89 (92.7%) had LBs and 7 (7.3%) SBs. Of 1315 illiterate women, 1241 (94.3%) had LBs and 74 (5.6%) SBs, of 1223 term births, 1157 (94.6%) had LBs and 66 (5.4%) SBs. Among the 92 (6.9%) preterm births, 84 (91.3%) had LBs and 8 (8.7%) SBs. Of 2459 women of low economic class, 2330 (94.7%) had LBs and 129 (5.3%) SBs, and out of 2299 (93.4%) term births 2187 (95.1%) LBs and 112 (4.9%) SBs, and of 160 (6.5%) preterm births, 143 (89.4%) were LBs and 17 (10.6%) SBs. Of 102 women of the upper middle economic class, 101 (99%) had LBs and one (1%) SB. All 98 (96.0%) term births were of LBterm births, 2756 (95.2%) LBs and 140 (4.8%) SBs, 240 had PT births with 215 (89.6%) LBs and 25 (10.4) SBs. Table one depicts the relationship between demographic features and SBs (Table 1).

Overall of 192 (4.9%) SBs, 31 (18.1%) SBs were among 517 women with hypertensive disorders of pregnancy (HDsP) 8 (4.4%) SBs amongst 280 women with moderate HDsP, 12 (6.9%) SBs amongst 175 women with severe HDsP, 11 (6.8%) SBs in 62 women with eclampsia.

Of 192 SBs 16 (2.4%) SBs were amongst 679 women with very severe anemia, 12 (1.8%) SBs in 667 women with severe anemia, 12 (1.8%) SBs amongst 664 women with moderate anemia, 8 (1.2%) SBs of 680 with mild anemia, 113 (16.2%) SBs. 4 5% SBs in 698 women with no obvious disorder. It was not possible to know more details as it is a community-based study in remote villages in hilly regions and information is based on what women and families told and their records. Amongst 192 SBs, 41 SBs were term FGR, 52 (27.0%) SBs were term AGA, 54 (28.1%) preterm FGR, 45 (23.4%) Preterm AGA term FGR 6 (4.2%) SBs were term AGA, 8 (4.3%) SBs and 7 (3.6%) SBs were preterm FGR, 9 (6.6%) preterm AGA (Table 2).

Discussion

Overall more than 2 million SBs occur annually worldwide and rates remain high. Skytte, et al. [4] reported that more than 2 million third-trimester stillbirths occur annually, most of them in low and middle-income countries (LMICs). Kingdom, et al. [5] reported that despite the increasing use of ultrasound the task of accurately identifying fetuses at risk of SB from chronic placental disorders continues to be elusive. In a study [6] of the high mortality share of groups 10 and 3, Robson's group demanded a case-by-case investigation. The high mortality rate observed for Robson groups 6–10 hinted at a need to intensify actions to improve labour management. Traditionally SB risk stratification incorporates maternal demographic characteristics such as age, parity, economic status, education, and pregnancy disorders.

Some people believe that an unborn baby may be possessed by a spirit or something similar to that [7]. Younger girls did

Table 1: Stillbirths In Relation To Variables.

Variable	Total Births		Term					Preterm				
			Total	Live Births		Stillbirths		Total	Live Births		Stillbirths	
Age	No	%		No	%	No	%		No	%	No	%
15 to 19	1200	30.7	1104	1044	94.6	60	5.4	96	89	92.7	7	7.3
20 to 29	2384	61	2236	2142	95.8	94	4.2	148	125	84.5	23	15.5
30 to 39	321	8.2	295	288	97.6	7	2.4	26	25	96.2	1	3.8
TOTAL	3905	100	3635	3474	95.6	161	4.4	270	239	88.5	31	11.5
EDUCATION												
ILLITERATE	1315	33.7	1223	1157	94.6	66	5.4	92	84	91.3	8	8.7
PRIMARY	1438	36.8	1327	1262	95.1	65	4.9	111	98	88.3	13	11.7
MIDDLE/ HIGH	847	21.7	786	758	96.4	28	3.6	61	52	85.2	9	14.8
GRADUCATE	192	4.9	188	186	98.9	2	1.1	4	3	75.0	1	25.0
POSTGRADUATE	113	2.9	111	111	100.0	0	0.0	2	2	100.0	0	0.0
TOTAL	3905	100	3635	3474	95.6	161	4.4	270	239	88.5	31	11.5
OCCUPATION												
HOMEMAKER	2432	62.3	2286	2167	94.8	119	5.2	146	134	91.8	12	8.2
UNSKILLED	895	22.9	811	778	95.9	33	4.1	84	75	89.3	9	10.7
SEMI-SKILLED	364	9.3	328	321	97.9	7	2.1	36	28	77.8	8	22.2
SKILLED	117	3	114	112	98.2	2	1.8	3	2	66.7	1	33.3
BUSINESS	97	2.5	96	96	100.0	0	0.0	1	0	0.0	1	100.0
TOTAL	3905	100	3635	3474	95.6	161	4.4	270	239	88.5	31	11.5
ECONOMIC STATUS												
UPPER	79	2	79	79	100.0	0	0.0	0	0	0.0	0	0.0
MIDDLE UPPER	102	2.6	98	98	100.0	0	0.0	4	3	75.0	1	25.0
MIDDLE	224	5.7	215	208	96.7	7	3.3	9	6	66.7	3	33.3
MIDDLE LOWER	1041	26.7	944	902	95.6	42	4.4	97	87	89.7	10	10.3
LOWER	2459	63	2299	2187	95.1	112	4.9	160	143	89.4	17	10.6
TOTAL	3905	100	3635	3474	95.6	161	4.4	270	239	88.5	31	11.5
PARITY												
P1	1473	37.7	1357	1276	94.0	81	6.0	116	108	93.1	8	6.9
P2/P3	2260	57.9	2120	2043	96.4	77	3.6	140	120	85.7	20	14.3
P4/ P5	106	2.7	96	94	97.9	2	2.1	10	8	80.0	2	20.0
ABOVE P5	66	1.7	62	61	98.4	1	1.6	4	3	75.0	1	25.0
Total	3905	100	3635	3474	95.6	161	4.4	270	239	88.5	31	11.5
BIOFUEL MASS USE												
YES	3136	80.3	2896	2756	95.2	140	4.8	240	215	89.6	25	10.4
NO	769	19.7	739	718	97.2	21	2.8	30	24	80.0	6	20.0
Total	3905	100	3635	3474	95.6	161	4.4	270	239	88.5	31	11.5

believe that poverty, lack of education, maternal ill health, and improper care during birth were the contributory factors. Blencowe, et al. [2] from the UK reported that every Newborn Action Plan (ENAP) targeted national SB rates (SBRs), of 12 or fewer SBs per 1000 births by 2030. Lawn, et al. [8] from UK reported that spontaneous PT births contributed to an estimated 30% of the 2·6 million annual SBs because the factors leading to preterm births were similar to those associated with SBs. In the present study also amongst 3635 term births, 161 (4.4%) had SBs, amongst 270 preterm births 31 (11.5%) had SBs, significantly more amongst preterm births. McClure, et al. [9] have reported substantially higher SBs with a weight ≥ 1000 gm in developing countries than reported SB rates in developed countries. In the present study, out of 192 SBs 3.1% of stillborn babies weighed < 1 kg, 4.1% ≥1 to <1.5 kg, 26.0% of SB babies weighed ≥ 1.5 to < 2 kg, 33.3% ≥ 2 to < 2.5, 33.3%, > 2.5 kg. Lawn, et al. [8] also opined that progress in reducing SB was slower than required to meet targets set to end preventable SB. Townsend, et al. [10] opined that SB prevention needed to be an international priority with individualized care and reducing unnecessary interventions. Yakoob, et al. [11] reported that interventions that targeted causes of SB could play an important role in reducing SBs. Potential social and behavioural interventions included birth spacing, smoking cessation, and control of indoor air pollution, although the evidence for these factors was weak. Seaton, et al. [12] did a study to know socioeconomic inequalities in the rates of SB and found that a wide deprivation gap existed in SB rates for most causes and was not diminishing. Flenady, et al. [13] reported close linkages between poverty, women's education, and disempowerment. In the present study of 2459 women of lower economic status 2187 (95.1%) LBs and 112 (4.9%) SBs, 160 (6.5%) preterm births with 143 (89.4%) were LBs and 17 (10.6%) SBs. Of 102 (2.6%) women of middle upper class, of 4 preterm births 3 (75.0%) were LBs and one (25.0%) SB. Andreasen, et al. [14] conducted a study for the detection of growth-restricted fetuses during pregnancy which led to fewer intrauterine deaths but increased adverse childhood outcomes. It was reported that SB risk was increased in undetected growth-retarted fetuses. Mozooni, et al. [15]

Table 2: Disorders and Stillbirths.

Disorders				Total Cases	SB	%
Hypertensive Disorders of Pregnancy	Moderate	Term	FGR	78	1	1.3
			AGA	34	2	5.9
		Preterm	FGR	116	3	2.6
			AGA	76	0	0.0
	Total			304	6	2.0
	Severe	Term	FGR	44	0	0.0
			AGA	27	2	7.4
		Preterm	FGR	54	3	5.6
			AGA	28	1	3.6
	Total			153	6	3.9
	Eclampsia	Term	FGR	11	1	9.1
			AGA	19	2	10.5
		Preterm	FGR	24	5	20.8
			AGA	16	1	6.3
	Total			70	9	12.9
Pregnancy with Anaemia	Very Severe	Term	FGR	21	8	38.1
			AGA	36	7	19.4
		Preterm	FGR	35	6	17.1
			AGA	23	9	39.1
	Total			115	30	26.1
	Severe	Term	FGR	81	8	9.9
			AGA	44	10	22.7
		Preterm	FGR	71	6	8.5
			AGA	39	5	12.8
	Total			235	29	12.3
	Moderate	Term	FGR	219	9	4.1
			AGA	300	10	3.3
		Preterm	FGR	355	12	3.4
			AGA	114	10	8.8
	Total			988	41	4.1
	Mildly	Term	FGR	323	8	2.5
			AGA	365	11	3.0
		Preterm	FGR	417	12	2.9
			AGA	270	10	3.7
	Total			1375	41	3.0
No Obvious Disorder		Term	FGR	144	6	4.2
			AGA	188	8	4.3
		Preterm	FGR	196	7	3.6
			AGA	137	9	6.6
Total				665	30	4.5
Total				3905	192	4.9

reported that acculturation was a multidimensional process to reduce the risk of SB through better communication and service utilization and eliminate risk. Rural tribal poor women find it very difficult to get preventive measures. Enhanced understanding of barriers to accessing health services and factors influencing and influenced by acculturation may help develop interventions to reduce the burden of SB. Ellis, et al. [16] did a study in the United Kingdom using a low-cost community system to estimate intrapartum SB in-home deliveries and the mean cluster-adjusted SB rate was 26/1000 births. Townsend, et al. [10] from the UK reported that the most frequently reported factors were maternal age, body mass index, and maternal diabetes. Boyle, et al. [17] reported that parent engagement may hold the key to important lessons for SB prevention and care. Further understanding of approaches, barriers, and enablers is warranted. Flenady, et al. [18] from Australia reported that despite a high proportion of unexplained SBs, many women have one or more risk factors that are often unrecognised. In the present analysis also 95.5% of SBs had some reasons, but 4.5% there was no reason visible. While unexplained SB is known in these cases, there are many possibilities. Rowe, et al. [19] from the UK reported that issues were identified around risk assessment and decisions about planning the place of birth, intermittent auscultation, transfer during labour, resuscitation, neonatal transfer, follow-up, and local review. While there are clear risk factors for SB, they are nonspecific and are often present in live births too. Sexton, et al. [20] from Australia opined that SB was a major global public health problem but in the absence of a robust method to predict a woman's individualized risk identifying increased risk remained a challenge. Awareness of factors that increase risk is a necessary step in improving care through better communication and shared decision-making, with the goal of reducing SB. Strategies based on

regional characteristics should be considered to reduce the burden of SB. Researchers also reported approximately 10% of SB attributed to fetal anomalies, but anomalies were also common in live births. In rural women, it may not be possible to know about anomalies as the cause of SB as happened in the present study also, limitations of the study. Ellson, et al. [21] from the UK reported that pregnancies with small-for-gestational-age (SGA) foetuses have an increased risk of SB and perinatal morbidity, and failure to recognise SGA antenatally increased risk. In the present study, 2189 were SGA babies out of which 95 (4.3%) were SB and of total AGA 1716 babies, 97 (5.6%) SBs. Amongst the total 921 term SGA babies, 41 (4.4%) were SBs, and amongst a total of 1261 preterm SGA, 52 (4.1%) were SBs, Amongst 1013 total term AGA 54 (5.3%) were SBs and of 703 preterms AGA 45 (6.4%) were SBs. Increasing knowledge of the causes of SB is a critical effort for prevention by addressing the causes. Mukherjee, et al. [22] did a review of studies to know about the modifiable risk factors of SBs in Sub-Saharan Africa (SSA) and reported the proportion of unexplained SBs remained very high. In the present study of 192 SBs 4.5% were in women without any cause, community-based study in villages. Most studies have been facility-based and also did not adjust for confounding factors. There are hardly any studies like the present; the rural community-based and prospective. More population-based, high-quality research is needed. Altijani, et al. [23] reported that studies have identified pregnancy complications such as anaemia and HDsP as risk factors amenable to interventions. However, these studies adopted study designs susceptible to bias or were primarily descriptive in nature. The study showed that the SB rate in 13 hospitals across six states in India was 21.3 per 1,000 births (18.5 - 24.4) and 80.3% of all SBs occurred intrapartum. Women's illiteracy (not being able to read or write) has been reported to be a significant structural risk factor. Additionally, having anaemia, experiencing HDP, preterm births, early term births and birth weight below the 10th percentile for gestational age were significant proximal risk factors. The study emphasized that several major risk factors for SBs were potentially modifiable, consistent with findings from other studies. In the present study, 192 SBs amongst anaemic women had 48 (7.2%) SBs, HDsP women had 31 (5.9%) SBs, and in 665 women who had no obvious disorder 30 (4.5%) 0 stillbirths occurred. Amongst 192 SBs 74 (38.54%) women were illiterate and 3 (1.5%) SBs amongst women graduated. These problems are potentially amenable to interventions. The association between preterm birth and SB is relatively well-established [24]. Amongst 270 preterm births, 239 (88.5%) were live births and 31 (11.5%) SB. Of 1200 adolescents 96 (8.0%) were PT 89 (92.7%) were LB and 7 (7.3%) SBs.

Summary and Conclusion

A total of 3905 births occurred over two years, amongst 3635 term births, 3474 (95.6%) live births, 161 (4.4%) SBs, and amongst 270 preterm births, 239 (88.5%) live births, 31 (11.5%) SBs. Of 192 total SBs, 48 (7.2%) were amongst 2690 women with anaemia, 16 (2.4%) amongst very severe anaemia, 12 (1.8%) SBs amongst 667 women with severe anaemia, 1.8% SBs were amongst 667 women with severe anaemia, 12 (1.8%) amongst 664 women with moderate anaemia, 8 (1.2%) amongst 680 women with mild anaemia. Overall 18. 1% of SBs was in women with HDsP. Most SBs were in women with disorders, but 4.5% SBs did occur in women with no disorder. SBs were significantly higher amongst babies weighing less than 1 kg, beyond this weight, numbers were similar.

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