

Community Based Study of Preterm Births, Small for Gestation and Low Birth Weight Babies in Rural Tribal Women with Extreme Poverty

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Abstract

Background: Globally one-sixth of new-borns are Low Birth Weight (LBW), single most important risk factor for Neonatal deaths (NNDs), Preterm births (PTB), Small for gestational age (SGA), Foetal Growth Restriction (FGR) are responsible for LBW and most of perinatal mortality.

Objective: Present community-based study was carried out to know burden of PTB, SGA, LBW babies among rural, tribal women.

Material and Methods: After ethics committee's approval prospective study was conducted in 100 villages.

Results: Over 2 years, 3713 women delivered, 2287 (61.6%) babies were LBW, 239 (6.4%) PT, 165 (69%) PT SGA, 916 (26.4%) of 3474 term babies were SGA. Overall 26.4% babies were <2 kg, 32.5% ≥ 2 to <2.5 kg, only 38.4% babies ≥ 2.5 kg. Of 55 mothers who had very very very (VVV) LBW (<1 kg) babies, 4 (7.3%) had hypertensive disorders of pregnancy (HDsP), 45 (81.8%) anaemic 3 (5.5%) had other disorders, 3 (5.5%) had no obvious disorder (P-value 0.7754). Of 129 women with VVLBW (≥ 1 to <1.5 kg) babies, 10 (7.8%) had HDsP, 107 (83.9%) anaemia, 9 (7.0%) other disorders, 3 (2.3%) had no obvious disorder (P-value 0.4842). Of 895 women with VLBW (≥ 1.5 to <2 kg) babies, 84 (9.4%) mothers had HDsP, 733 (81.9%) anaemia, 49 (5.5%) other disorders, 29 (3.2%) no obvious disorder (P-value <0.0001). Of 1208 women with babies of ≥ 2 to <2.5 kg babies, 112 (9.3%) had HDsP, 971 (80.4%) had anaemia, 87 (7.2%) other disorders, 38 (3.1%) no obvious disorder (P-value 0.0205). There were 6.4% perinatal deaths 7.4% amongst 2287 <2.5kg, 4.8% of 1426 ≥ 2.5 kg (P-value 0.0085).

Conclusion: Preterm births were not high but many babies were LBW, only 38.4% NW, 69% PT and 26.4% term babies were SGA. Anaemia seemed to be a major contributor.

Keywords: Preterm births, Small for Gestational Age, Low Birth Weight, Perinatal Deaths, Maternal Disorders

Background

Birth weight has a vital role in determining new-borns survival [1]. Globally one-sixth of all new-borns have been reported to be of LBW, birth weight less than 2500 grams, single most important underlying risk factor for neonatal morbidity and mortality [2, 3]. Preterm births (PTB) have been reported to be a major contributor

to LBW and perinatal mortality [4, 5]. South Asian countries India, Pakistan, Bangladesh and Nepal have been reported to account for nearly half of the LBW babies born in Asia [6]. Global nutrition targets set at the World Health Assembly in 2012 included 30% reduction in LBW between 2012 to 2025 [7]. But it does not seem to be happening!. Preterm birth defined as, birth before 37 weeks

gestation and is a major cause of neonatal morbidity and mortality. Nearly 11% of births worldwide occur preterm, making the identification and minimisation of potential risk factors, a global public health priority [8]. Gardosi opined that the SGA babies were associated with poor outcomes but size alone did not define FGR, which was defined as 'failure to reach the full genetic growth potential' [9].

Objective

Present community based prospective study was carried out to know the burden of PTB, Small for Gestational Age (SGA) and LBW babies among rural, tribal women.

Material and Methods

After approval of ethics committee which works as per Helsinki declaration, the study was conducted in 100 villages of Dharni Block of Melghat where community-based services were initiated after creating a health facility in one of the 100 villages to provide 24 hours services, especially for mothers and babies. Villages were visited by research assistant for collecting information about PTB, SGA and LBW babies on prospective basis. Consent was taken to collect desired information with pretested tool.

Results

Over 2 years, 3713 women delivered and only 1426 (38.4%) babies were of normal weight (NW) (≥ 2.5 kg) and around two third 61.6% of LBW, one third even less than 2kg as 1208 (32.5%) babies were between ($\geq 2 - < 2.5$ kg), and 895 (24.1%) VLBW ($\geq 1.5 - < 2$ kg), and 5% less than 1.5kg, 129 (3.5%) were VVLBW ($\geq 1 - < 1.5$ kg) and 55 (1.5%) VVVLBW (< 1 kg). Total 239 (6.4%) women had PTB and 3474 (93.6%) term births. Overall, 165 (69%) of 239 PT babies were SGA babies and 916 (26.4%) of 3474 term babies were SGA, statistically high significantly more PT babies were SGA (P-value < 0.0001). Overall, 1081 (29.1%) of 3713 women had SGA babies. Out of 3713 women, 1133 (30.5%) women were of 15-19yrs. In these adolescents 89 (7.9%) had PT births and 1044 (92.1%) term births. Of all 1133 adolescents 482 (42.5%) had NW babies, 373 (32.9%) LBW babies, 239 (21.1%) VLBW babies, 27 (2.4%) VVLBW babies and 12 (1.1%) VVVLBW babies. Total 57 (64%) of 89 adolescents had PT SGA babies and 242 (23.2%) of 1044 term born babies were SGA. Overall, 207 (5.5%) women were of 30-34yrs, of them 18 (8.7%) had PT births (P-value 0.0005) and 189 (91.3%) had term births. Total 83 (40.1%) of 207 were NW babies, 51 (24.6%) LBW babies, 49 (23.7%) VLBW babies, 14 (6.8%) VVLBW babies and 10 (4.8%) VVVLBW babies. Total 3 (16.7%) of 18 PT babies were SGA and 54 (28.6%) of 189 term born babies were SGA. Of 3713 women 1241 (33.4%) were illiterate and 84 (6.8%) of them had PT births and 1157 (93.2%) term births, 436 (35.1%) had NW babies, 412 (33.2%) LBW babies, 321 (25.9%) VLBW babies, 51 (4.1%) VVLBW babies and 21 (1.7%) VVVLBW babies. Total 55 (65.5%) of 84 PT babies were SGA and 311 (26.9%) of 1157 term born babies were SGA. And of 246 (6.6%) women with high school education, 19 (7.7%) had PT births and 227 (92.3%) term births, 102 (41.5%) had NW babies, 74 (30.1%) LBW babies,

59 (24%) VLBW babies, 8 (3.3%) VVLBW babies and 3 (1.2%) VVVLBW babies, eleven (57.9%) of 19 PT babies were SGA and 75 (23.2%) of 227 term born babies were SGA. Of 2301 (67.9%) of 3713 housewives, 134 (5.8%) had PT births and 2167 (94.2%) term births, 807 (35.1%) had NW babies, 778 (33.8%) LBW babies, 587 (25.5%) VLBW babies, 90 (3.9%) VVLBW babies and 39 (1.7%) VVVLBW babies, one hundred fourteen (85.1%) of 134 PT babies were SGA and 562 (25.9%) of 2167 term born babies were SGA. Of 853 (23%) labourers, 75 (8.8%) had PT births, quite higher than housewives (P-value 0.173) and 778 (91.2%) had term births, 347 (40.6%) had NW babies, 274 (32.1%) LBW babies, 195 (22.9%) VLBW babies, 26 (3.0%) VVLBW babies and 11 (1.3%) VVVLBW babies, forty-three (57.3%) of 75 PT babies were SGA and 261 (33.5%) of 778 term born babies were SGA. Overall, 559 (15.1%) of 3713 working women (skilled, semi-skilled workers, doing small businesses), 30 (5.4%) had PT and 529 (94.6%) term births, 272 (48.6%) had NW babies, 156 (27.9%) LBW babies, 113 (20.2%) VLBW babies, 13 (2.3%) VVLBW babies and 5 (0.9%) had VVVLBW babies, Eight (26.7%) of 30 PT babies were SGA and 93 (17.6%) of 529 term born babies were SGA. Amongst economically lower, and lower middle class 3319 (89.4%) of 3713 women, 230 (6.9%) had PT births and 3089 (93.1%) term births, 1201 (36.2%) NW babies, 1121 (33.8%) LBW babies, 825 (24.8%) VLBW babies, 120 (3.6%) VVLBW babies and 53 (1.6%) VVVLBW babies, one hundred sixty-two (70.4%) of 230 PT babies were SGA and 872 (28.2%) of 3089 term born babies were SGA. And in the 315 (8.4%) women of upper lower and upper middle class, 9 (2.8%) had PTB (P-value 0.0091) and 306 (97.1%) term births, 165 (52.4%) had NW babies, 69 (21.9%) LBW babies, 69 (21.9%) VLBW babies, 9 (3.5%) VVLBW babies and 2 (0.6%) VVVLBW babies. Three (33.4%) of 9 PT babies were SGA and 44 (14.4%) of 306 term born babies were SGA. Of 3713 women, 1384 (37.3%) were primi-para, 108 (7.8%) of them had PT births and 1276 (92.2%) term births, 527 (38.1%) had NW, 452 (32.7%) LBW babies, 333 (24.1%) VLBW babies, 51 (3.7%) VVLBW babies and 21 (1.5%) VVVLBW babies, eighty-nine (82.4%) of 108 PT babies were SGA and 315 (24.7%) of 1276 term born babies were SGA. Of 166 (4.5%) women who had 4 and more births, 11 (6.6%) had PT births (P-value 0.2297) and 155 (93.4%) term births, 55 (33.1%) had NW babies, 55 (33.1%) LBW babies, 44 (26.5%) VLBW babies, 7 (4.2%) VVLBW babies and 5 (3.1%) VVVLBW babies, three (27.3%) of 11 PT babies were SGA and 57 (36.8%) of 155 term born babies were SGA. Overall, 2971 (80.1%) of 3713 pregnant women who were using biomass fuel, 215 (7.2%) had PT births and 2756 (92.8%) term births, 925 (31.1%) had NW babies, 1069 (36%) LBW babies, 831 (28%) VLBW babies, 103 (3.5%) VVLBW babies and 55 (1.9%) VVVLBW babies, one hundred fifty-three (71.2%) of 215 PT babies were SGA and 824 (29.9%) of 2756 term born babies were SGA. Of 742 (19.9%) women not using biomass fuel, 24 (3.2%) had PT births (P-value 0.0004) and 718 (96.8%) term births, 501 (67.5%) had NW babies, 139 (18.7%) LBW babies, 64 (8.6%) VLBW babies, 26 (3.5%) VVLBW babies and no VVVLBW babies, twelve (50%) of 24 PT babies were SGA and 92 (12.8%) of 718 term babies were SGA [Table-I & II].

Table- I: Preterm, Term Births and Small for Gestational Age

VARIABLES AGE	TOTAL BIRTHS	BIRTHS				SMALL FOR GESTATIONAL AGE			
		PRE TERM	%	TERM	%	PRE TERM	%	TERM	%
15 to 19	1133	89	7.9	1044	92.1	57	64.0	242	23.2
20 to 24	1549	91	5.9	1458	94.1	78	85.7	469	32.2
25 to 29	718	34	4.7	684	95.3	26	76.5	138	20.2
30 to 34	207	18	8.7	189	91.3	3	16.7	54	28.6
35 to 39	106	7	6.6	99	93.4	1	14.3	13	13.1
TOTAL	3713	239	6.4	3474	93.6	165	69.0	916	26.4
EDUCATION									
ILLITERATE	1241	84	6.8	1157	93.2	55	65.5	311	26.9
PRIMARY	1360	98	7.2	1262	92.8	71	72.4	389	30.8
MIDDLE	564	33	5.9	531	94.1	27	81.8	124	23.4
HIGH	246	19	7.7	227	92.3	11	57.9	75	33.0
GRADUCATE	189	3	1.6	186	98.4	1	33.3	14	7.5
POST GRADUCATE	113	2	1.8	111	98.2	0	0.0	3	2.7
TOTAL	3713	239	6.4	3474	93.6	165	69.0	916	26.4
OCCUPATION									
HOUSEWIFE	2301	134	5.8	2167	94.2	114	85.1	562	25.9
UNSKILLED WORKER	853	75	8.8	778	91.2	43	57.3	261	33.5
SEMI-SKILLED	349	28	8.0	321	92.0	8	28.6	54	16.8
SKILLED WORKER	114	2	1.8	112	98.2	0	0.0	28	25.0
BUSINESS	96	0	0.0	96	100.0	0	0.0	11	11.5
TOTAL	3713	239	6.4	3474	93.6	165	69.0	916	26.4
ECONOMIC STATUS									
UPPER	79	0	0.0	79	100.0	0	0.0	0	0.0
UPPER MIDDLE	101	3	3.0	98	97.0	1	33.3	3	3.1
UPPER LOWER	214	6	2.8	208	97.2	2	33.3	41	19.7
LOWER MIDDLE	989	87	8.8	902	91.2	56	64.4	108	12.0
LOWER	2330	143	6.1	2187	93.9	106	74.1	764	34.9
TOTAL	3713	239	6.4	3474	93.6	165	69.0	916	26.4
PARITY									
P1	1384	108	7.8	1276	92.2	89	82.4	315	24.7
P2	1461	85	5.8	1376	94.2	54	63.5	436	31.7
P3	702	35	5.0	667	95.0	19	54.3	108	16.2
P4	102	8	7.8	94	92.2	2	25.0	24	25.5
P5 ABOVE	64	3	4.7	61	95.3	1	33.3	33	54.1
TOTAL	3713	239	6.4	3474	93.6	165	69.0	916	26.4
BIOMASS FUEL USER									
YES	2971	215	7.2	2756	92.8	153	71.2	824	29.9
NO	742	24	3.2	718	96.8	12	50.0	92	12.8
TOTAL	3713	239	6.4	3474	93.6	165	69.0	916	26.4

Table-II: Birth Weight of Babies

VARIABLES AGE	TOTAL BIRTHS	BIRTH WEIGHT OF BABIES											
		VVVLBW		VVLBW		VLBW		LOW BIRTH WEIGHT		NORMAL WEIGHT			
		≤ 1	%	≥ 1 TO ≤ 1.4	%	1.5 TO ≤ 2	%	≥ 2 TO ≤ 2.4	%	≥ 2.5 TO ≤ 2.9	%	≥ 3	%
15 to 19	1133	12	1.1	27	2.4	239	21.1	373	32.9	306	27.0	176	15.5
20 to 24	1549	17	1.1	53	3.4	356	23.0	414	26.7	422	27.2	287	18.5
25 to 29	718	11	1.5	24	3.3	226	31.5	338	47.1	93	13.0	26	3.6
30 to 34	207	10	4.8	14	6.8	49	23.7	51	24.6	69	33.3	14	6.8
35 to 39	106	5	4.7	11	10.4	25	23.6	32	30.2	26	24.5	7	6.6
TOTAL	3713	55	1.5	129	3.5	895	24.1	1208	32.5	916	24.7	510	13.7
EDUCATION													
ILLITERATE	1241	21	1.7	51	4.1	321	25.9	412	33.2	284	22.9	152	12.2
PRIMARY	1360	20	1.5	47	3.5	331	24.3	458	33.7	330	24.3	174	12.8
MIDDLE	564	10	1.8	18	3.2	137	24.3	184	32.6	134	23.8	81	14.4
HIGH	246	3	1.2	8	3.3	59	24.0	74	30.1	64	26.0	38	15.4
GRADUCATE	189	1	0.5	4	2.1	33	17.5	47	24.9	65	34.4	39	20.6
POST GRADU- CATE	113	0	0.0	1	0.9	14	12.4	33	29.2	39	34.5	26	23.0
TOTAL	3713	55	1.5	129	3.5	895	24.1	1208	32.5	916	24.7	510	13.7
OCCUPATION													
HOUSEWIFE	2301	39	1.7	90	3.9	587	25.5	778	33.8	518	22.5	289	12.6
UNSKILLED WORKER	853	11	1.3	26	3.0	195	22.9	274	32.1	218	25.6	129	15.1
SEMI-SKILLED	349	4	1.1	10	2.9	74	21.2	102	29.2	104	29.8	55	15.8
SKILLED WORKER	114	1	0.9	3	2.6	22	19.3	30	26.3	39	34.2	19	16.7
BUSINESS	96	0	0.0	0	0.0	17	17.7	24	25.0	37	38.5	18	18.8
TOTAL	3713	55	1.5	129	3.5	895	24.1	1208	32.5	916	24.7	510	13.7
ECONOMIC STATUS													
UPPER	79	0	0.0	0	0.0	1	1.3	18	22.8	34	43.0	26	32.9
UPPER MID- DLE	101	0	0.0	1	1.0	19	18.8	21	20.8	38	37.6	22	21.8
UPPER LOWER	214	2	0.9	8	3.7	50	23.4	48	22.4	72	33.6	33	15.4
LOWER MID- DLE	989	12	1.2	34	3.4	241	24.4	314	31.7	253	25.6	135	13.7
LOWER	2330	41	1.8	86	3.7	584	25.1	807	34.6	519	22.3	294	12.6
TOTAL	3713	55	1.5	129	3.5	895	24.1	1208	32.5	916	24.7	510	13.7
PARITY													
P1	1384	21	1.5	51	3.7	333	24.1	452	32.7	342	24.7	185	13.4
P2	1461	19	1.3	45	3.1	342	23.4	454	31.1	383	26.2	218	14.9
P3	702	10	1.4	26	3.7	176	25.1	247	35.2	157	22.4	86	12.3
P4	102	3	2.9	4	3.9	27	26.5	34	33.3	21	20.6	13	12.7

P5 ABOVE	64	2	3.1	3	4.7	17	26.6	21	32.8	13	20.3	8	12.5
TOTAL	3713	55	1.5	129	3.5	895	24.1	1208	32.5	916	24.7	510	13.7
BIOMASS FUEL USER													
YES	2971	55	1.9	103	3.5	831	28.0	1069	36.0	620	20.9	305	10.3
NO	742	0	0.0	26	3.5	64	8.6	139	18.7	296	39.9	205	27.6
TOTAL	3713	55	1.5	129	3.5	895	24.1	1208	32.5	916	24.7	510	13.7

Overall, of 55 VVVLBW (<1 kg) babies, 4 (7.3%) babies' mothers had HDsP, 45 (81.8%) babies mothers had anaemia [5 (11.1%) very severe, 13 (28.9%) severe, 15 (33.3%) moderate, 12 (26.7%) mild anaemia] and 3 (5.5%) babies mothers had other disorders and 3 (5.5%) mothers had no obvious disorder. Overall, of 129 VVLBW (≥ 1 to <1.5 kg) babies, 10 (7.8%) babies' mothers had HDsP, 107 (83.9%) babies mothers had anaemia [12 (11.2%) very severe, 27 (25.2%) severe, 46 (43.0%) moderate, 22 (20.6%) mild] and 9 (7.0%) babies mothers had other disorders and 3 (2.3%) had no obvious disorder. Overall, of 895 VLBW (≥ 1.5 to <2 kg) babies, 84 (9.4%) babies' mothers had HDsP, 733 (81.9%) babies mothers had anaemia [17 (2.3%) very severe, 49 (6.7%) severe, 301 (41.1%) moderate, 366 (49.9%) mild anaemia] and 49 (5.5%) babies mothers had other disorders and 29 (3.2%) mothers had no obvious disorder. Overall, of 1208 LBW (≥ 2 TO <2.5 kg) babies, 112 (9.3%) babies' mothers had HDsP, 971 (80.4%) babies mothers had anaemia [34 (3.5%) very severe, 76 (7.8%) severe, 374 (98.5%) moderate, 487 (50.2%) mild anaemia] and 87 (7.2%) babies mothers had other disorders and 38 (3.1%) mothers had no obvious disorder. Of 1426 NW (≥ 2.5 kg) babies, 245 (17.2%) babies mothers had HDsP, 761 (53.4%) babies mothers had anaemia [23 (3.1%) very severe, 46 (6.1%) severe, 228 (29.9%) moderate and 464 (60.9%) mild anaemia] and 157 (11%) babies mothers had other disorders and 263 (18.4%) mothers had no obvious disorder.

Overall, of 55 VVVLBW babies, 9 (16.4%) were PT SGA babies and 41 (74.5%) term born SGA babies, two (3.6%) PT babies had early NNDs and 4 (7.3%) term born babies had early NNDs, one (1.8%) PT baby had late NND and 2 (3.6%) term born babies had late NNDs. Overall 129 VVLBW babies, 19 (14.7%) were PT SGA babies and 65 (50.4%) term born SGA babies, four (3.1%) PT babies had early NNDs, 7 (5.4%) term born babies had early NNDs, 2 (1.6%) PT babies had late NNDs and 3 (2.3%) term born babies had late NNDs. Overall, 895 VLBW babies, 33 (3.7%) were PT SGA babies and 224 (25.0%) were term born SGA babies, 3 (0.3%) PT babies had early NNDs, 11 (1.2%) term born babies had early NNDs, 3 (0.3%) PT babies had late NNDs and 2 (0.2%) term born babies had late NNDs. Overall, of 1208 LBW babies, 63 (5.2%) were PT SGA babies, 335 (27.7%) term born SGA babies, five (0.4%) PT babies had early NNDs, 10 (0.8%) term born babies had early NNDs, one (0.1%) PT baby had late NND and 3 (0.2%) term born babies had late NNDs. Overall, 1426 NW babies, 65 (4.5%) PT SGA babies, 288 (20.2%) term born SGA babies and 2 (0.1%) had early NNDs both terms born babies. There was one (0.07%) late NND of a term born baby [Table-III]. Overall, 6.4% perinatal deaths occurred, of which 21.8% were among 55 of <1kg, 13.9% of 129 ≥ 1 - <1.5kg, 6.6% of 895 ≥ 1.5 - <2kg, 6.5% of 1208 ≥ 2 - <2.5kg, 4.8% of 1426 ≥ 2.5 kg, mortality decreased as weight increased.

Table-III: Maternal Complications and Birth Weight

TOTAL BIRTHS		TO-TAL	%	VVVLBW		VVLBW		VLBW		LBW		NORMAL WEIGHT	
		3713		≤ 1	%	≥ 1 TO \leq 1.4	%	≥ 1.5 TO \leq 2	%	≥ 2 TO \leq 2.4	%	≥ 2.5	%
HDsP		455	12.3	4	0.9	10	2.2	84	18.5	112	24.6	245	53.8
Anaemia	VERY SEVERE	91	2.5	5	5.5	13	14.3	19	20.9	33	36.3	21	23.1
	SEVERE	211	5.7	18	8.5	37	17.5	41	19.4	74	35.1	41	19.4
	MOD	964	26.0	47	4.9	87	9.0	225	23.3	374	38.8	231	24.0
	MILD	1351	36.4	37	2.7	96	7.1	356	26.4	478	35.4	384	28.4
No Obvious Cause		411	11.1	3	0.7	9	2.2	49	11.9	87	21.2	263	64.0
Others		230	6.2	3	1.3	3	1.3	29	12.6	38	16.5	157	68.3
SMALL FOR GESTATIONAL AGE	PRE TERM	165	4.4	9	5.5	19	11.5	33	20.0	63	38.2	41	24.8
	TERM	916	24.7	41	4.5	65	7.1	224	24.5	335	36.6	251	27.4

NEONATAL DEATHS	EARLY (≤ 7 DAYS)	PRE TERM	14	0.4	2	14.3	4	28.6	3	14.3	5	35.7	0	0.0
		TERM	34	0.9	4	11.8	7	20.6	11	11.8	10	29.4	2	5.9
	LATE (≥ 7 to 28 DAYS)	PRE TERM	7	0.2	1	14.3	2	28.6	3	14.3	1	14.3	0	0.0
		TERM	11	0.3	2	18.2	3	27.3	2	18.2	3	27.3	1	9.1
	TOTAL		66	1.8	9	13.6	16	24.2	19	13.6	19	28.8	3	4.5

Discussion

Globally, it is estimated that 15–20% of all births, or more than 20 million babies annually born are LBW. It has been reported that low and middle-income countries contributed to a disproportionate burden of LBW and over 95% of the world's LBW infants are born in LMICs, however with marked global and regional variations in LBW rates [10]. with association between placental dysfunction and spontaneous as well as medically indicated PTB. Placenta continues to be an enigmatic organ and the concept of placental bed disorders is the beginning of the path of knowledge about so called unexpected PTB, LBW and SGA. Researchers reported that over a 33-years period the LBW centiles for term births have increased, with progressively higher rates of iatrogenic PTB [11]. LBW is a significant prognosticator of high infant morbidity and mortality [12]. LBW can also lead to postnatal stunting, impairment of growth and development, micronutrient deficits, compromised psychomotor development, high rates of general morbidity and chronic diseases in later age too [13-17]. In the present study of 3713 women who delivered, only 1426 (38.4%) had NW babies (≥ 2.5 kg), 1208 (32.5%) babies were of (≥ 2 to < 2.5 kg), 895 (24.1%) babies of VLBW (≥ 1.5 to < 2 kg), 129 (3.5%) babies of VVLBW (≥ 1 to < 1.5 kg) and 55 (1.5%) babies of VVVLBW (< 1 kg). Total 239 (6.4%) women had PT and 3474 (93.6%) term births. Overall, 165 (69%) of 239 PT babies were SGA babies, 916 (26.4%) of 3474 term born babies were SGA and total 1081 (29.1%) of 3713 women had SGA babies. Overall, 1133 (30.5%) of 3713 were adolescents, 42.5% of them had NW babies, 57.5% LBW babies. Amongst 1241 (33.4%) illiterate women, 35.1% had NW babies and 64.9% LBW babies, of 2301 (67.9%) of 3713 housewives, 35.1% of them had NW babies and 64.9% LBW babies, of 853 (23%) labourers, 40.6% had NW babies and 59.4% LBW babies. Amongst 3319 (89.4%) of 3713 economically lower and lower middle-class women, 36.2% had NW babies and 63.8% LBW babies. So rural scenario seems to be different than recorded in literature. However, increasing interventions are shifting the birth weight cut offs that define birth weight centiles and thereby redefining what constitutes SGA. A lot of research is needed [18]. Women with depression during pregnancy are at increased risk for PTB and LBW. Such disorders are not known to rural poor women, they do not even consult [19]. Anaemia seemed a major contributor to LBW. In the present study 2617 (70.4%) of 3713 women were anaemic, 25.8% of them had NW babies, 74.2% LBW babies. Jessani et al reported that at 6+0-13+6 weeks gestation age, stillbirth, SGA and births weight < 2500 g, were significantly associated with Hb of 70-89 g/L as compared to Hb of 110-129 g/L [20]. The relationships of adverse pregnancy outcomes with various Hb levels were more marked at 26-30 weeks of gestation

age. PTB and FGR babies have been reported to have multifactorial underlying causes and the biological pathways and preventive strategies for these two conditions have been reported to be quite different [21]. Maternal age and ethnicity had significant relation with BW [22]. In the present study 1133 (30.5%) of 3713 women were adolescents 42.5% of them had NW babies, 57.5% LBW babies. So, numbers of LBW were not more amongst adolescents. Evidence linkage between household air pollution to LBW babies is there [23]. In the present study overall of 2971 (80.1%) of 3713 women were using biomass fuel, of them 31.1% had NW babies, 68.9% LBW babies, those not using biomass fuel, 67.5% had NW babies, 32.5% had LBW babies. There was a big difference between the two. The estimated worldwide LBW prevalence in 2015 was 14.6% compared with 17.5% with range of 14.1- 21.3 in 2000 with average Annual Reduction Rate (AARR) of 1.23% in 2015, an estimated 20.5 million live born were LBW. 91% from low and middle income countries, mainly Southern Asia (48%) and Sub-Saharan Africa (24%). Although these estimates suggested some progress in reduction of LBW between 2000 and 2015, achieving the 2.74% AARR required between 2012 and 2025 to meet the global nutrition needs to be more than double with improved measurement and programme investments to address the causes of LBW throughout the lifecycle. Many factors affected the duration of gestation and foetal growth, and thus, the birth weight [7]. Anderson et al did population-based study and reported that of extreme prematurity, infants ≤ 24 weeks' gestation are at highest risk of death or major morbidity [24]. In population-based study, extremely preterm infants remain at risk for death and major morbidity, with 22 to 25-week gestation infants being at highest risk. prevalence. Cohort study by Perry et al, maternal haemodynamic differences in gestational hypertension with SGA babies (HDsP and SGA), gestational hypertension with appropriate-for-gestational-age babies (HDsP only) with control pregnancies and reported that women with HDsP and SGA present with more severe haemodynamic dysfunction than only HDsP [25]. Central haemodynamic changes may play a role in the pathogenesis of pre-eclampsia and should be considered alongside placental aetiology. In the present study also HDsP contributed to a higher LBW number. In the study by Andreasen et al which explored association between antenatal detection of FGR and adverse outcome and found that the detection of FGR and risk of adverse childhood conditions, possibly caused by prematurity [26]. Iatrogenic prematurity may be inevitable in stillbirth prevention, but is accompanied by a risk of long-term childhood conditions. Gehani et al opined that authors evaluated the effect of asymptomatic bacteriuria screening and evidence-based treatment on the incident of low birth weight and preterm births [27]. The incidence of low births

weight/ preterm births in the intervention group was lower than the control group. In the present study overall only 1426 (38.4%) of 3713 babies were NW and 61.6% were ≤ 2.5 kg, number much higher than one sixth global reported, 2103 (56.6%) were VLBW and 184 (5%) were VVLBW. Overall, 1426 NW babies, 65 (4.5%) PT babies were SGA babies, 288 (20.2%) term SGA babies and 2 (0.1%) had early NNDs both term babies and one (0.07%) had late NND of a term baby and 245 (17.2%) babies mothers had HDsP, 761 (53.4%) babies mothers had anaemia.

Overall, of 2103 VLBW babies, 92 (4.4%) were PT SGA babies, 559 (26.6%) term SGA babies, 8 (0.4%) PT babies had early NND, 21 (0.9%) term babies had early NND, 4 (0.2%) PT babies had late NND and 5 (0.2%) term babies had late NND and 196 (9.3%) babies mothers had HDsP and 1704 (81.1%) babies mothers had anaemia. The rural women living in extreme poverty had no means of repeated sonography and FGR detection. Some never had a sonography, others may not have even known about USG. Anaemia seemed to be a major factor and action is essential to prevent this preventable public health issue.

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