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TO FIND OUT DETERMINANTS OF LOW BIRTH WEIGHT BABIES AMONG BELOW POVERTY LINE PATIENT ADMITTED TO A TERTIARY CARE LEVEL HOSPITAL OF NORTH CHHATTISGARH

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HOW TO CITE THIS ARTICLE:

Rakesh Nahrel, Hemalata Thakur, Deepak Tandan, Meena Armo, Sachin Pandey. "To find out Determinants of Low Birth Weight Babies among below Poverty Line Patient Admitted to a Tertiary Care Level Hospital of North Chhattisgarh". Journal of Evolution of Medical and Dental Sciences 2015; Vol.4, Issue 81, October 08; Page: 14225-14232, DOI:10.14260/jemds/2015/2022

ABSTRACT: BACKGROUND: Low birth weight (LBW) is a public health problem, it is major determinants of infant mortality and morbidity. Causes of LBW are multi factorial. The principal aim of this study was to find out determinants of LBW at tertiary care level hospital. **OBJECTIVE:** 1. To find out the determinants of low birth weight babies. 2. To compare the maternal risk factors for LBW among below poverty line and above poverty line. **METHOD:** This study was hospital based cross sectional study at Chhattisgarh institute of medical sciences Bilaspur. 538 low birth weight babies irrespective of gestational age were included in our study. The data information was gathered from maternal health record, neonatal health records and interviewing the mother of these neonate. The data analyzed by enter into the SPSS package. **RESULT:** Total 903 neonate admitted during study period, among that 55% are LBW and out of that 25.6% belongs to BPL families. We found that among BPL and APL family percentage of various maternal risk factors are: age <20 year (30.43%) and (15.5%), height <145cm (61.6%) and (89.75%), heavy physical work (58.6%) and (8%), maternal education <primary (62.3%) and (28%), multiparity (68.11%) and (59%), inadequate ANC visit (76.8%) and (58%), anemia (67.3%) and (39%), addiction (65.94%) and (29%), and birth order > 3 were 77.53%, are various maternal risk factors for LBW among both groups. **CONCLUSION:** All though causes of LBW are multi factorial, but poor socioeconomic condition is not very significant risk factor for LBW other factors i.e maternal education, physical labor during pregnancy, age, parity, inadequate ANC visit poor maternal weight gain during pregnancy is seems to be a major risk factors among BPL as well as APL group. In our observation we found that proportion of LBW babies are more or less same in both group.

KEYWORDS: LBW (Low birth weight), BPL (Below poverty line), APL (Above poverty line) prematurity, IUGR (Intra uterine growth retardation), Maternal risk factor.

BACKGROUND: Low birth weight (LBW) has been defined by the World Health Organization (WHO) as weight at birth of less than 2500 g. LBW at birth may be the outcome of either preterm birth (Before 37 weeks of gestation) or retarded fetal (Intra uterine) growth.^[1] The weight of the infant at birth is a most important predictors of infant growth and survival and is depends on maternal health and nutrition during pregnancy.^[2] Incidence of LBW is variable its depends on region. Asia has highest incidence with 21% to 28% to LBW.^[3] In India prevalence of LBW range from 10% in high socioeconomic status to 56% in low socioeconomic and slums area.^[4] LBW is responsible for high perinatal and infant mortality. The LBW about 5 to 6 time more likely die during early neonatal period while 3 time more likely to die during infancy as compared to baby birth weight >2500gm. Low birth weight account 75% of all perinatal deaths and 33% of infants death. Many maternal and fetal factors are associated with

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LBW and many of these factors are interrelated.^[5] Chhattisgarh is developing state of India and about 42.52% population are below poverty line.^[6] The purpose of this study is to identify the maternal factors affecting birth weight of baby and also know the any relationship of poverty line with LBW.

MATERIAL AND METHODS: The present study was conducted in the teaching hospital of north CG, in Chhattisgarh Institute of Medical Sciences (CIMS) department of Paediatrics Bilaspur India. It was a hospital based cross sectional comparative study. The study data were collected between January 2014 to June 2014 by interview with mothers and abstraction of medical record of mothers and new born babies. The study consisted of 538 case of LBW babies admitted in the NICU. Selection of cases were according to inclusion criteria. All neonates weight less than 2500gm, irrespective of gestational age were included. Then it is divided in to two group on the basis of Poverty line ei; below poverty line (BPL) and above poverty line (APL), and comparative study was done in between both group on same parameter. BPL family grouped on the basis of, government of India criteria for BPL those who are BPL card holder or those who full fill the criteria of poverty of Prasad classification in class -V group. A Proforma was made with respect of history taking, detail physical examination, investigation and treatment. For assessment of IUGR, clinical feature and Collarado intrauterine growth chart and Ponderal index was used. For assessment of gestational age and prematurity Extended Ballard Scoring was used. Complete history was taken from mothers of these LBW babies regarding maternal age, parity, education, profession of mother, type of family, Poverty line status (BPL/APL), spacing, antenatal visits, drug intake, Gudakhu and tobacco chewing, maternal history of pregnancy induce hypertension, anemia, chronic disease, infections. Data were analyzed by standard statistical formula using statistical package for social science program (SPSS 11.5 version). Chi square test were used to check the association and comparative analysis between two groups of study population. P value $<0.05/X^2 =$ or >3.58 was considered to be Significant.

RESULT: Total number of 903 neonates admitted in NICU in study period between January 2014 to June 2014. We included only LBW baby's with, birth weight less than 2500 gram in our study, among them 538 are low birth weight. Out of these 538 babies 138(25.6%) belongs to BPL families and 400 (74.4%) belongs to APL families, the percentage of LBW was (55%) out of total NICU admission. In our observation most of the LBW babies belongs to gestational age >37 weeks (IUGR) in both groups (55.79%) in BPL group and 53.0% in APL group there is no significant difference between both group, as well as Proportion of small for date babies are almost similar in both group. Only (44.2%) of babies are preterm in BPL families and (47%) in APL families. It was also observed that among BPL families majority 69.55% babies were in birth weight range of 1500-2499gram and minimum 5.07% belongs to birth weight <1000 gram, more or less similar finding observed in APL families, majority 66.75% were in the birth weight range of 1500-2499 gram and minimum 5.0% in <1000 gram range. Distribution of LBW neonates according to sex among BPL family's male (64.49%) and female(35.59%), among APL families male(48.5%) and female (51.5%) there is no significant Correlation between LBW and sex of child. We observed that in both group APL as well as BPL group almost half of the cases referred in from peripheral health centre and other private nursing homes to our institute.

According to table no-2 Maternal risk factors for LBW observed that less percentage of LBW babies are delivered by mother age between 20 to 30 year of age among BPL group (47.8%) and APL group (22.5%), while mother age <20 year found more in BPL group (30.43%) and age >30 year

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observed in APL group (62.0%) which is quite significant in our observation. Short stature is one of the important risk factor for LBW in our observation we also found 61.6% in BPL & 89.75% in APL mothers belong to height <145cm we also found it was very significant risk factor in our observation. We also observed that among BPL families LBW is common among heavy worker 58.6% and less among sedentary worker (18.1%), but among APL families it was quite prevalent among moderate worker (61%) as compared to heavy worker only (8%), as risk factors are multifactorial so it's difficult to establish correlation between two demographically different group it may be two different set of synergetic factors are responsible.

Regarding maternal education, we observed that it was a significant risk factor for LBW in both groups. LBW quite common among low educated mother's but proportion are very less among highly educated mother with graduate and post graduate qualification only (4.34%) in BPL & (24%) in APL mothers. Regarding parity of mother, we found that among multipara LBW were greater proportion in both groups it was 68.11% among BPL mother & 59.0% in APL mother, we found it significant correlation between LBW and multiparity of mother in our study. We also observed that majority of LBW babies are born by the mother with total weight gain <12kg during pregnancy, 64.4% among BPL mother and 58% among APL mother. In our study we observed there is significant association of LBW and inadequate ANC visit, 76.8% in BPL and 42% in APL mothers. We also found anemia, PIH, birth order >3 and birth spacing <2 year are significant risk factor for LBW as shown in table-2. Our study observed that addiction is another risk factor for LBW and we observed it is present in 65.94% of BPL group as compare to 29% of APL group which is significant.

DISCUSSION: During the study period, 903 neonates were admitted in NICU, among them majority of baby were referred from outside. These outborn babies were referred from District Hospital, CHC/PHCC/Sub centre of Bilaspur District and also from surrounding district and private Hospital. In our study we found 57.5% babies of BPL group and 49% of APL group were referred from outside while study done by other observer they found 74% were inborn and 26% were out born referred to government hospital.^[7] In our study this large number of referral may be because of large number of deliveries in Chhattisgarh conducted at home (81.6%), only 18.1% deliveries are institutional (DLHS3.2007 2008).^[8] Similar result also observed regarding place of delivery by Prasad V et al.^[9] In this study 55% (n=538) of all admitted babies were low birth weight, among them 25.6% newborn were belonging to BPL family and 74.4% were from APL family. In Chhattisgarh state BPL population are 42.52% of total population and Chhattisgarh government provided diet and health care facility to them through Mukhyamantri Khadyanna Yojna & RSBY/MSBY respectively ^[6,10]. In this study we tried to find out prevalence of various risk factors among BPL and APL group and also know any difference in between these two groups. Gestational age is one of the most important predictors of LBW, and we observed majority of LBW were full term (IUGR) babies and it is shown 55.97% in BPL group and 53.0% in APL group, while prematurity shown 42.2% in BPL group and 47% in APL group. It is indicated that prematurity and IUGR are important predictors for LBW which is predominant associated in both BPL and APL group. Similar finding are noted by Kutubur Rahman et al where incidence of LBW due to prematurity were 50.86% and term IUGR were 49.13 % and study by Patil Ravindra B. et al observed incidence of LBW due to prematurity were 38% and term babies were 62%.^[7,11] In this study LBW according to weight we observed more than two thirds babies weight were in between 1500gram to 2499gram in both group, only 5% baby birth weight were <1000 grams in both group, as such there is no significant differences seen in both BPL and APL group of LBW babies related to weight. Similar

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finding also noted in other studies regarding distribution of LBW as per weight.^[7,11] In our study we found 57.5% babies of BPL group and 49% of APL group were referred from outside while study done by other observer they found 74% were inborn and 26% were outborn.^[7]

In present study we observed 30.34% LBW were associated with maternal age <20year of BPL groups compare to 15.5% in APL group, while in mothers age >30year LBW found more in APL group (62.0%) against BPL group 21.7%. This differences may be because of late marriage in urban area and APL group while early marriage in rural area (21.3%) of Chhattisgarh DLHS-3.^[8] Maternal age factors for LBW also studies by various observer and reported same results.^[12,13,14] Short stature (<145 cms) is one of the predictors for LBW, in our study this is present in 38.4% in BPL and 10.25% in APL group of LBW. Association of LBW with maternal short stature also reported by other study.^[12,15] Birth weight of babies also depends on maternal physical work, in present study we found LBW is common in among heavy worker mother (58.6%) of BPL family while in APL family 61% moderate workers mothers associated with LBW. Various other studies also shown association of physical work and LBW as predictors.^[12,16] On observation of type of family we found more than 50% of mother of LBW babies belonging to joint family in both group. Similar results also observed by Jyoti Bala Jain et al they found 61.05% of LBW mothers are related with joint family.^[12] Parity is also known risk factors for LBW, as the parity increases the incidence of LBW also increase. In this study results revealed 68.11% multipara mothers of BPL and 59.0% multipara mothers of APL group were associated with LBW babies. Although the difference in between these two groups are not a significant. The present study is similar to Jyoti Bala Jain et al.^[12] This study also results that majority of LBW babies are born by the mother with total weight gain is <12kg during pregnancy and 64.4% of BPL mother and 58% of APL mother not gained weight >12kg during pregnancy. A study done by Radha Kumari P et al they found none of the mothers of LBW baby gained weight >10 kg during pregnancy.^[14]

Adequate antenatal care are essential for better outcome for mother and neonate. In Chhattisgarh about 51.2% mother not receiving adequate ANC visit (DLHS-3).^[8] In this study we observed there is significant association of LBW and inadequacy of ANC visit here 76% of BPL and 58% of APL mothers did not received adequate ANC visit. In our study is similar to study done by Deshpande Jayant D et al, Negi SK et al, Mumbare Sachin et al.^[16,17,18] Maternal medical problems also carry risk of LBW babies, in this study we observed anemia, PIH, maternal infection etc had association with LBW. Anemia has got significant influence on birth weight of the baby and it observed in 67% BPL mother and 39% in APL mothers of LBW. Similar finding were observed by various studies.^[14,16,19,20] In our study we also found association of addiction and LBW, 65.5% LBW mothers had addiction of Gudakhu or Tobacco consumption while in APL mothers addictions rate are less. Study done by Deshpande Jayanti D et al, Mumbare Sachin et al also found association of LBW with tobacco consumption.^[16,18] Birth spacing and Birth order of baby both are predictors for LBW, in this study 56.52% of BPL mother and 63.0% of APL mothers had less than 2 year birth spacing. Similar results also reported by Deshpadne Jayanti D et al and Radha Kumari P et al.^[14,16, 19, 20] In this study we found 74.63% LBW babies of BPL family are 4 to 6 birth order but in APL family majority of LBW were 1 to 3 birth order (83%). Other observer reported majority of LBW were shown in < 2 birth order.^[11,14]

CONCLUSION: This study suggests that there are several factors interplaying which lead to LBW babies even sociodemographic factors like maternal age, educational level, maternal profession, anemia and tobacco addiction are very important risk factors in both group, but below poverty line and Above poverty line maternal nutrition is not a significant risk factor in our state. It may be because of

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Chhattisgarh government policy providing diet and treatment in free of cost by Mukhyamantri Khadhyan Yojna (Social food security scheme of CG govt. for BPL families) and RSBY (Rashtriya Swasthya Bima Yojna) respectively, to BPL families. Strategy to reduce LBW in rural community we have to focus on education, importance of ANC visit, reduce family size with adequate spacing, iron vitamins supplementation during pregnancy along with discouraging tobacco addiction. For that BCC (Behavior changes communication) to rural community and urban poor's is need to be introduced.

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Variable N=538	BPLN=138	Non BPLN=400
Gestational age		
<28 week	11(7.97%)	36(9.0%)
28-32 week	14(10.14%)	44(11.0%)
32-37 week	36(26.08%)	108(27%)
>37 week	77(55.79%)	212(53.0%)
Type of low birth weight		
Pre term-	61(44.2%)	188(47%)
IUGR-	77(55.79%)	212(53%)
Both-	58(42.02%)	142(35.5%)
LBW according to weight (in gram)		
<1000	07(5.07%)	20(5.0%)
1000-1499	35(25.36%)	113(28.25%)
1500-2499	96(69.56%)	267(66.75%)
Sex		
Male	89(64.49%)	194(48.5%)
Female	49(35.59%)	206(51.5%)
Place of delivery		
Delivered in our institute	59(42.5%)	204(51%)
Referred from out side	79(57.5%)	196(49%)

Table 1: Distribution of low birth weight babies according to characteristic

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Variable N=538	Below poverty line N=138	Above poverty line N=400	Chi square test p< 0.005 N=538
Age in year <20 20-30 >30	42(30.43%) 66(47.8%) 30 (21.7%)	62(15.5%) 90(22.5%) 248(62.0%)	X ² =25.78,df=4 Significant
Height <145 cm >145 cm	53(38.4%) 85(61.6%)	41(10.25%) 359(89.75%)	X ² =53.78,df=1 Significant
Type of physical work Sedentary worker Moderate worker Heavy worker	25(18.1%) 32(23.1%) 81(58.6%)	124(31.0%) 244(61%) 32(8%)	X ² =6.78,df=4 Significant
Maternal education Ill literate/Primary Secondary to 12 th Graduate/post graduate	86(62.3%) 46(33.3%) 06(4.34%)	112(28.0%) 192(48.0%) 96(24.0%)	X ² =16.78,df=4 Significant
Type of family Joint family Nuclear family	72(52.17%) 66(47.8%)	208(52.0%) 192(48.0%)	X ² =0.017,df=1 Not Significant
Parity Primipara Multipara	44(31.8%) 94(68.11%)	164(41.0%) 236(59.0%)	X ² =3.59,df=1 Significant
Total weight gain in pregnancy <12 kg >12 kg	89(64.4%) 49(35.5%)	232(58%) 168(42%)	X ² =1.79,df=1 Not significant
No. of ANC visit Adequate Inadequate	32(23.18%) 106(76.8%)	168(42.0%) 232(58.0%)	X ² =15.54,df=1 Significant
Medical history Anemia PIH Maternal infection No medical complication	93(67.3%) 14(10.14%) 03(2.17%) 28(20.28%)	156(39.0%) 64(16.0%) 16(4.0%) 164(41.0%)	X ² =14.28,df=9 Significant
Birth spacing <2 year 2-5 year >5 year	78(56.52%) 57(41.3%) 03(2.17%)	252(63.0%) 134(33.5%) 14(3.5%)	X ² =2.89,df=4 Not Significant
H/O addiction Present Absent	91(65.94%) 47(34.05%)	116(29.0%) 284(71.0%)	X ² =59.15,df=1 Significant
Birth order 1-3 4-6 >7	31(22.46%) 103(74.63%) 04(2.89%)	332(83%) 66(16.5%) 02(0.5%)	X ² =41.35,df=4 Significant

Table 2: Maternal risk factors for low birth weight babies

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Date of Submission: 26/09/2015.
Date of Peer Review: 28/09/2015.
Date of Acceptance: 29/09/2015.
Date of Publishing: 08/10/2015.