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## Association between Birth Weight of the Babies and Mode of Delivery: A Cross-Sectional Study

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DOI: <https://doi.org/10.3329/bafmj.v57i1.76428>

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### ABSTRACT

**Background:** Birth weight has significant short and long-term effects on health and survival and is a useful predictor of prenatal and postnatal development. Birth weight is likely to play a key role for the infant's survival because it is one of the strongest predictors of infant mortality risk. The aim of the study was to find out the association between birth weight and mode of delivery.

**Methods:** This was a cross-sectional study conducted at Combined Military Hospital, Ghatail from 15 March 2019 to 30 June 2019. Secondary data were used, which were collected from hospital register during the period of 01 January 2018 to 31 December 2018. The study population was all the newborn babies delivered in CMH, Ghatail during that period and mothers of the newborn babies were respondents of the study.

**Results:** Out of 526 respondents majority (64.83%) were in the age group of 23-32 years with mean age 25.14(range: 18-40) years. Of the newborn babies around half (48.3%) were male. The mean birth weight was 2.92 kg with minimum weight 1.2 kg and maximum 4.2 kg. The data showed that the prevalence of Low Birth Weight (LBW) 13.1%. Majority (84.6%) of the mothers didn't have any comorbidity, few (15.4%) suffered from comorbidity. 53.8% babies were born by caesarean section (CS) and 46.2% were delivered by normal vaginal delivery. Among the low birth weight babies 65.2% were born by CS. Statistically significant association was found between birth weight of the babies and mode of delivery ( $p < 0.05$ ).

**Conclusion:** Caesarean section cannot be routinely recommended, unless there are other obstetric indications.

**Keywords:** Birth weight, Mode of delivery, Gestational age

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**Received:** 24 April 2024

**Accepted:** 12 August 2024

## INTRODUCTION

As the primary determinant of newborn health and wellbeing, birth weight has come to dominate infant health policy. It is a significant indicator of future health and survival in infancy as well as maturity. The lack of or scarcity of empirical data has prevented a thorough evaluation of the birth weight issues. Nonetheless, a good number of research has been carried out globally, and a variety of risk factors for LBW have been identified over time. These variables include the anthropometric and demographic characteristics of the mother, her nutrition, and many other aspects. A WHO policy paper estimates that, globally, between 15% and 20% of all newborns are LBW, or more than 20 million births annually. Low birth weight is linked to a number of short and long-term health issues and is still a major public health concern worldwide.<sup>1</sup>

In 1992, WHO and UNICEF released the first estimates of LBW rates on a national, regional, and global scale. Using household survey data adjusted for underreporting of low birth weight—a process initially devised by Boerma JT—UNICEF proposed that at that time, the rate of low birth weight was approximately 7% in industrialized countries and ranged between 5% and 33% with an average of 17% in less developed countries.<sup>2</sup>

Not only is low birth weight a significant predictor of prenatal death and morbidity, but new research indicates that low birth weight significantly raises the chance of developing non-communicable diseases (NCDs) including diabetes and cardiovascular disease in later life.<sup>3</sup> Low- and middle-income nations account for the vast majority of low birth weight newborns, particularly among the most vulnerable populations.<sup>4</sup> Low birth weight can be caused by a variety of factors, such as repeated pregnancies, infections, early

induction of labor or cesarean delivery (for medical or non-medical reasons), and chronic illnesses like diabetes and high blood pressure.<sup>5</sup> Low birth weight can lead to poor cognitive development, an increased risk of chronic diseases later in life, and foetal and neonatal mortality and morbidity.<sup>6</sup>

## MATERIALS AND METHODS

This was a cross-sectional study conducted at Combined Military Hospital, Ghatail from 15 March 2019 to 30 June 2019. Secondary data were used and which were collected from the hospital register during the period of 01 January 2018 to 31 December 2018. The study population was all the newborn babies delivered in CMH, Ghatail during that period and mothers of the newborn babies were respondents of the study.

All pregnant women received minimum 3 Ante Natal Checkup (ANC) during their pregnancy. Birth Weight (BW) of baby is the weight of the live born baby measured in grams within 1 hour of delivery. Baby weights weighing at least 2,500 grams were considered average birth weights (ABWs). Newborns classified as Low Birth Weight (LBW) have a birth weight of less than 2500 grams, while Very Low Birth Weight (VLBW) newborns have a birth weight of fewer than 1500 grams.<sup>7</sup> Statistical Package for the Social Sciences (SPSS) version 25.0 was used to edit, code and analyze the data. Numerical data were expressed as mean and standard deviation (SD), whereas categorical data were expressed as frequency and percentage. Chi-square test was done to find out the association between birth weight and mode of delivery. Statistical significance was considered as  $p < 0.05$ .

## RESULTS

A cross-sectional study was conducted at Combined Military Hospital, Ghatail during the

period of 15 March 2019 to 30 June 2019. The study population was all the newborn babies delivered in CMH, Ghatail from 01 January 2018 to 31 December 2018. The findings of the study derived from the data analyses are presented below.

**Table-I:** Socio demographic information of the respondents (n=526)

Demographic variables	Frequency	Percent
<b>Age (years)</b>		
≤ 22	151	28.70
23-32	341	64.83
> 32	34	6.47
Mean ± SD (range): 25.14 ± 4.17 (18-40)		
<b>Occupation of mother</b>		
Student	195	37.07
Homemaker	279	53.04
Service	27	5.13
Business	25	4.76
<b>Status of Husband</b>		
Officer	06	1.1
Non officer	496	94.3
Civil	24	4.6

Table-I reveals that the majority 341(64.83%) of the respondents were in the age group of 23-32 years with mean age 25.14 and range 18-40 years. Nearly one third 151(28.7%) were less than 22 and very few 34(6.47%) were above 32 years old. Majority i.e. 279(53.06%) of the respondents were homemaker and only 25(4.76%) were business holder. Almost all the respondents' husbands were non officer, very few 4.6(4.6%) were civilians and only (1.1%) was officer.

**Table-II:** Distribution of the babies by birth weight and sex (n=526)

Birth weight and Sex	Frequency	Percent
<b>Birth-weight (kg)</b>		
< 2.5	69	13.1
≥ 2.5	457	86.9
Mean ± SD (range): 2.92 ± 0.44 (1.2-4.2)		
<b>Sex</b>		
Male	254	48.3
Female	272	51.7

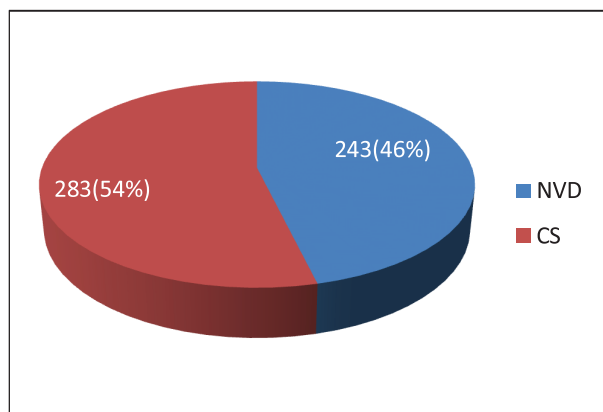
Of the newborn babies around half 254(48.3%) were male. The mean birth weight was 2.92 kg with minimum weight 1.2 kg and maximum 4.2 kg. Above table showed that only 13.1% babies were born with low birth weight.

**Table-III:** Distribution of the mothers by obstetric characteristics (n=526)

Obstetric characteristics	Frequency	Percent
<b>Parity</b>		
Primi	140	26.6
Second	195	37.1
Third	137	26
More than three	54	10.3
<b>Gestational age at delivery (weeks)</b>		
<37 (preterm )	65	12.4
37-40 (term)	430	81.7
>40 (Post term)	31	5.9
<b>Co morbidity of mother</b>		
Yes	81	15.4
No	445	84.6

Over 140(26.6%) of the mothers were primi, 195(37.1%) were second gravida, 137(26%) were third gravida and the rest 54(10.3%) were

more than three gravida. Majority 445(84.6%) of the mothers didn't have any comorbidity, few 81(15.4%) suffered from comorbidity (Table-III).



**Fig-1:** Distribution of respondents by mode of delivery (n=526)

Majority i.e. 53.8% babies were born by CS (Fig-1).

**Table-IV:** Distribution of respondents by mothers' occupation (n=526)

Occupation	Birth weight		Significance
	<2.5	≥ 2.5	
Student	29	250	p=.000
Homemaker	16	179	
Service	14	13	
Business	5	20	
Total	69	457	

The above table depicts that out of 69 low birth weight babies, 29 mothers were student, 16 were homemaker, 14 were service holder and 5 were businesswomen. Statistically significant association was found between birth weight and occupation of mother (p<0.01).

**Table-V:** Association between birth weight of the babies and mode of delivery (n=526)

Birth weight (in kg)	CS n(%)	NVD n(%)	Significance
<2.5	45(65.2)	24(34.8)	p=.027
≥ 2.5	238(52.1)	219(47.9)	

The above table shows that among the 526 babies, 69 were found under weight and 457 found normal weights. Among 64 underweight 45(65.2%) were born by CS and 24(34.8%) were born by normal vaginal delivery (NVD). Among 457 babies 238(52.2%) were born by CS and 219(47.9%) were born by normal delivery. Out of 69 low birth weight baby 45(65.2%) were born by CS. Statistically significant association was found between birth weight of baby and mode of delivery (p<.05).

## DISCUSSION

The main emphasis of baby health policy is birth weight since it is the most reliable and sensitive indicator of infant morbidity and mortality. Low birth weight (LBW) is still a major problem for global public health both in industrialized and developing nations.

The study found that the prevalence of LBW newborns delivered at CMH, Ghatail was 13.1% which was significantly lower than the national average of 22.6%.<sup>8,9</sup> As the study was carried out among spouses of Armed Forces personnel who are often financially solvent, the low prevalence of LBW is justified. The study showed the increased prevalence of CS (53.8%) among the Armed Forces personnel. The optimal rate for cesarean sections has been regarded by the global healthcare community since 1985 as being between 10% and 15%.<sup>10</sup> Since then, both in wealthy and developing

nations, cesarean sections have been more prevalent. A caesarean section can successfully reduce mother and infant mortality when medically indicated. In the past few decades, the use of CS has skyrocketed globally, especially in middle- and high-income nations. This is true even though there isn't enough data to support significant benefits for mothers and perinatal when CS rates exceed a certain threshold and some studies have found a connection between higher CS rates and worse outcomes.

The study showed that maximum 341(64.83%) mothers age was 23-32 years followed by 151(28.7%) were up to 22 years and 34(6.47%) were more than and mean age of the mothers 25.14±4.17. The study conducted by Cole et al found that pregnant women were aged from 13 to 44 years and median age was 24 years which was almost similar to the present study.<sup>10</sup> Of the newborn babies around half (48.3%) were male. Out of 69 low birth weight babies, 29 mothers were student, 16 were homemaker, 14 were service holder and 5 were businesswomen. The mean birth weight was found 2.92 kg with minimum weight 1.2 kg and maximum 4.2 kg. The study conducted by Moreria et al found birth weight from 1.3 to 4.9 kg with mean 3.2 kg.<sup>11</sup>

The study revealed that among the 526 babies, 69 were found under weight and 457 found normal weights. Statistically significant association was found between birth weight and occupation of the respondents ( $p < 0.01$ ). Among 69 underweight 45(65.2%) were born by CS and 24(34.8%) were born by normal vaginal delivery, though it was not evaluated that whether CS was indicated or not,  $p$ -value (0.027) was found statistically significant. So, there is a strong association between birth weight of babies with mode of delivery which is similar to the study conducted by Hüseyin et al.<sup>12</sup>

Studies from numerous nations have consistently noted a number of potential causes for the rising rates of cord clamping, including pain phobia, worries about genital alterations following vaginal delivery, the false belief that CS is safer for the infant, convenience for medical personnel as well as for the mother and family, fear of medical malpractice, and a lower threshold for any complications or less-than-ideal outcomes.

## CONCLUSION

The present study demonstrates that low birth weight rate is high in caesarean section though it was not evaluated that whether CS was indicated or not, further study is required to assess it properly. Preterm delivery may significantly be reduced by proper evaluation and treatment of co-morbidities. Caesarean section cannot be routinely recommended, unless there are other obstetric indications.

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