Original Article
DOI: https://doi.org/10.70749/ijbr.v3i7.2797

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://ijbr.com.pk
ISSN: 2960-2793/ 2960-2807

Frequency of Low Birth Weight Babies in Patients with Short Inter-Pregnancy Interval

Sheeba Jatoi[1], Jahan Ara Hassan[2]

[1,2]Department of Obstetrics & Gynecology, Dow International Medical College, DUHS Ojha Campus, Karachi, Sindh, Pakistan.

ARTICLE INFO

Keywords: Interpregnancy Interval, Low Birth Weight Babies, Anemia.

Correspondence to: Sheeba Jatoi, Department of Obstetrics & Gynecology, Dow International Medical College, DUHS Ojha Campus, Karachi, Sindh, Pakistan.
Email: sheebajatoi21@gmail.com

Declaration
Authors' Contribution
Both authors equally contributed to the study and approved the final manuscript

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 29-05-2025 Revised: 24-06-2025
Accepted: 04-07-2025 Published: 10-07-2025

ABSTRACT

Objectives: To determine the frequency of low birth weight babies in patients with short inter-pregnancy interval. **Study type:** cross sectional study. **Settings:** Department of Obs & Gynae, Dow International Medical College, DUHS Ojha Campus, Karachi. **Duration of study:** 25th February 2025 to 24th May 2025. **Methodology:** A total of 163 women in the age range of 18 to 40 years, with a gestational age of 37 to 41 weeks, and with a short inter-pregnancy interval were included. Diabetes mellitus (FBS >110 mg/dl on two consecutive occasions), pre-eclampsia (B.P >130/90 mmHg and proteinuria on dipstick), hepatic dysfunction and heart disease (s/bilirubin >1 mg/dl), severe intrauterine growth retardation (determined by ultrasonography), antepartum hemorrhage, and h/o chronic hypertension were all excluded. Patients were assured of their anonymity and gave their informed agreement before their data was used in study. Next, the following were recorded: age, gestational age, parity, height, weight, BMI, anemia (yes/no), location of residence (rural/urban), and monthly income (<20000/20000-40000/40000). Low birth weight babies (yes/no) weighing less than 2.5 kg were observed in all moms. **Results:** The study's participants ranged in age from 18 to 40 years, with a mean age of 28.54 ± 5.93 years. Mean gestational age was 38.43 ± 1.52 weeks. Mean BMI was 29.43 ± 4.51 kg/m2. 18 (11.04%) patients with short inter-pregnancy interval had low birth weight babies. **Conclusion:** It is determined that a short period between pregnancies might considerably result in low birth weight, which can be prevented by extending the time between pregnancies. This can be accomplished by advising people to use effective contraception.

INTRODUCTION

In recent decades, birth spacing has emerged as a key component of health promotion programs for women and children in underdeveloped nations. Pregnancy and delivery outcomes have been found to be impacted by the interpregnancy interval (IPI).[1] There is growing interest in the connection between perinatal health and the interpregnancy period. Poor obstetric treatment is indicated by perinatal mortality. Approximately 4 million of the 130 million babies born globally pass away within the first four weeks of life, while over three million survive.[2] Over 76 million perinatal fatalities are thought to occur globally each year, with poor nations accounting for 98% of these deaths.[3]

The elements that put the mother's and the unborn child's lives at jeopardy are known as pregnancy risk factors. Neonatal mortality, low birth weight, stillbirth, baby abnormalities, and mother death from difficult delivery are the most adverse pregnancy outcomes. Poor nutrition, child spacing, maternal ages under 15 and over 35, inadequate prenatal care, and lifestyle choices like smoking, being overweight, or being obese are some examples of these issues.[4] To improve perinatal outcomes, it has been suggested that pregnancies be spaced appropriately. Thus, birth spacing is a crucial factor to take into account while making family plans. Babies weighing fewer than 2500 grams at delivery are classified as "low birth weight," regardless of gestational age.[5] It has been claimed that the short interval between pregnancies results in inadequate restoration of the mother's nutrient depot, which in turn causes the baby to be born with low birth weight.[6] 11.97% of patients with a short interpregnancy interval had low birth weight babies.[7] According to Kannaujiya AK et al., 19.4% of patients with short IPI had low birth weight kids.[8] According to Mubasher S. et al., 7.7% of pregnant women with short inter-pregnancy intervals have low birth weight kids.[9] According to Onwuka CC, et al., 7.3% of pregnant women with short inter-pregnancy intervals had low birth weight kids.[10]

The purpose of this study is to ascertain the prevalence of low birth weight babies in patients with short interpregnancy intervals in the local population, even though it is already known that this interval is a risk factor for low birth weight babies. However, there is a dearth of local data on this topic. Since most of our population lives in rural areas and lacks formal education, they are largely ignorant of the negative consequences of shorter inter-pregnancy intervals for both mothers and newborns. The study's findings will be useful in raising public awareness and serving as a guide to maintain the recommended interpregnancy interval in order to prevent low birth weight babies.

METHODOLOGY

The ethical review committee approved this descriptive, cross-sectional study, which was conducted at the Department of Obs & Gynae, Dow International Medical College, DUHS Ojha Campus, Karachi, from February 25 to May 24, 2025. A total of 163 women in the age range of 18 to 40 years, with a gestational age of 37 to 41 weeks (as determined by LMP), and with a short inter-pregnancy interval (less than 12 months between the last delivery date and the last menstrual period of the index pregnancy) were included. The following presumptions are used for calculating the sample size of 163 in health studies using the World Health Organization's (WHO) software: Absolute precision is 4%, the percentage of low birth weight babies in the short IPI is 7.3%[10], and the confidence level is 95%. Diabetes mellitus (FBS >110 mg/dl on two consecutive occasions), pre-eclampsia (B.P >130/90 mmHg and proteinuria on dipstick), hepatic dysfunction and heart disease (s/bilirubin >1 mg/dl), severe intrauterine growth retardation (determined by ultrasonography), antepartum hemorrhage, and h/o chronic hypertension were all excluded.

Patients were assured of their anonymity and gave their informed agreement before their data was used in study. Next, the following were recorded: age, gestational age, parity, height, weight, BMI, anemia (yes/no), location of residence (rural/urban), and monthly income (<20000/20000-40000/40000). Low birth weight babies (yes/no) weighing less than 2.5 kg were observed in all moms. A freshly created proforma was used to record all of the data.

SPSS 25.0 was used for data analysis. The data's normality was examined using the Shapiro-Wilk test. The mean +_ standard deviation or median (IQR) was used to characterize age, gestational age, and BMI. Frequencies and percentages were used to define anemia (yes/no), place of residence (rural/urban), monthly income (<20000/20000-40000/40000), and low birth weight kids (yes/no). Age, gestational age, BMI, anemia (yes/no), location of residence (rural/urban), and monthly income (<20,000/20000-40000/>40,000) were all taken into consideration when stratifying the data. The chi square/fisher exact test was used for post-stratification, and a p-value of less than 0.05 was considered significant.

RESULTS

The study's participants ranged in age from 18 to 40 years, with a mean age of 28.54 ± 5.93 years. According to Table I, the majority of the patients, 87 (53.37%), were between the ages of 18 and 30 years. Mean gestational age was 38.43 ± 1.52 weeks. Mean BMI was 29.43 ± 4.51 kg/m^2. Distribution of patients according to different variables is shown in Table I.

According to Figure I, 18 (11.04%) patients with short inter-pregnancy interval had low birth weight babies. Stratification of low birth weight with respect to effect modifiers is shown in Table II.

Table I

Distribution of patients according to different variables (n=163)

		Frequency	%age
Age (years)	18-30	87	53.37
	31-40	76	46.63
Gestational age (weeks)	37-39	79	48.47
	40-41	84	51.53
BMI (kg/m^2)	≤30	84	51.53
	>30	79	48.47
Anemia	Yes	53	32.52
	No	110	67.48
Residence	Rural	82	50.31
	Urban	81	49.69
Monthly income	<20000	68	41.72
	20000-40000	54	33.13
	>40000	41	25.15

Figure I

Frequency of low birth weight babies in patients with short inter-pregnancy interval (n=163).

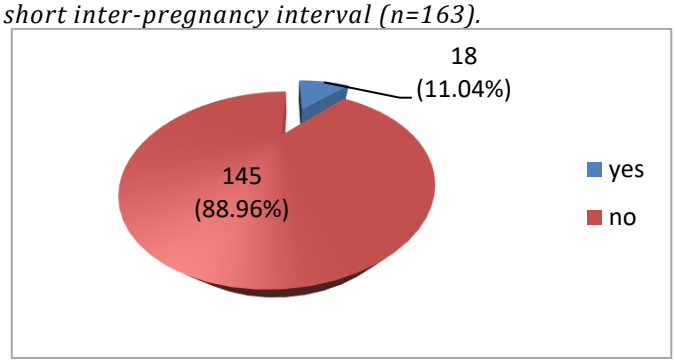

Table II

Stratification of low birth weight with respect to effect modifiers.

		Yes (n=18)	No (n=145)	P-value
Age (years)	18-30	11 (12.64%)	76 (87.36%)	0.485
	31-40	07 (9.21%)	69 (90.79%)	
Gestational age (weeks)	37-39	06 (7.59%)	73 (92.41%)	0.173
	40-41	12 (14.29%)	72 (85.71%)	
BMI (kg/m^2)	≤30	13 (15.48%)	71 (84.52%)	0.034
	>30	05 (5.62%)	84 (94.38%)	
Anemia	Yes	12 (22.64%)	41 (77.36%)	0.001
	No	06 (5.45%)	104 (94.55%)	
Residence	Rural	10 (12.20%)	72 (87.80%)	0.637
	Urban	08 (9.88%)	73 (90.12%)	

Monthly income	<20000	08 (11.76%)	60 (88.24%)	0.875
	20000-40000	05 (9.26%)	49 (90.74%)	
	>40000	05 (12.20%)	36 (87.80%)	

DISCUSSION

The time that passes between two consecutive pregnancies is known as the inter-pregnancy interval (IPI). The ideal interpregnancy interval (IPI) is a crucial factor in determining maternal health and pregnancy outcomes in women, while improperly timed pregnancy raises health risks for both the mother and the child. It should be highlighted, nonetheless, that the classification of IPI differs slightly between studies, making it challenging to compare data from various studies.[11,12]

Participants in the study were between the ages of 18 and 40, with a mean age of 28.54 ± 5.93. An average gestational age of 38.43 ± 1.52 weeks was recorded. The mean BMI was 29.43 ± 4.51 kg/m2. Low birth weight babies were born to 18 (11.04%) patients with short intervals between pregnancies. 11.97% of patients with a short interpregnancy interval had low birth weight babies.[7] According to Kannaujiya AK et al., 19.4% of patients with short IPI had low birth weight kids.[8] According to Mubasher S. et al., 7.7% of pregnant women with short inter-pregnancy intervals have low birth weight kids.[9] Onwuka CC, et al. found that 7.3% of pregnant women with short interpregnancy intervals had low birth weight kids.[10]

Short interpregnancy intervals (less than or equal to 8 months) were associated with preterm delivery but not with low birth weight, per the results of the Basso et al. study. The adjusted odds ratios for preterm birth were 2.28 (1.49 to 3.48) for intervals between 4.01 and 8.00 months and 3.60 (95 percent CI 2.04 to 6.35) for intervals up to 4.00 months when comparing deliveries between 24 and 36 months. There was a 3.5 percent chance of premature birth when comparing deliveries between 24 and 36 months. The risk was higher for women with a history of full-term pregnancies. Age, parity, and social status were all taken into account.[13]

One-third (35%) of the 2,253 pregnancies in a second study by the researchers were conceived within 18 months of a prior delivery. Women who were married or between the ages of 15 and 19 at the time of conception of the index pregnancy, who started having children after the age of 30, and who reported the pregnancy as unintended were significantly more likely to have a short interpregnancy interval than those who were not, when sociodemographic and childbearing characteristics were taken into consideration. The likelihood of planning short interpregnancy intervals was higher among women from better socioeconomic levels (married, non-Hispanic white, college educated, or non-Medicaid delivery). We think we could reduce the percentage of women with short interpregnancy intervals from 35% to 23% if we could prevent unintended pregnancies.[14]

The Bener et al. study[15] found that mothers with a shorter interpregnancy gap (40.3 percent) were more likely to have low birth weight babies, while mothers with a longer interpregnancy interval (24 months) were less likely to have normal birth weight babies (44.7 percent). Women under 25 years of age (49.4%; p0.001) and those who were illiterate (13.1%) were more likely than the controls to have an interpregnancy interval of 612 months, and they were also more likely to have a low birth weight infant. During the first trimester, women who gave birth to low birth weight babies received less prenatal care (p0.001). Women with a short birth interval had a lower chance of having a normal delivery when compared to controls (79 percent) and cases (58.7 percent) (p=0.001). In one study, low birth weight was linked to a J-shaped relationship with the interpregnancy interval.[15]

Another Tanzanian study[16] found that the median IPI was 36 months. When compared to IPIs of 24–36 months (reference group), short interpregnancy intervals (24 months) were linked to low birth weight (OR 1 • 61; 95 percent confidence interval [CI] 1 • 34–1.72), perinatal death (OR 1 • 63; 95 percent confidence interval [CI] 1.22–1.91), and preterm delivery (OR 1 • 52; 95 percent confidence interval [CI] 1.31–1.74). Preterm birth and low birth weight were also linked to longer IPIs of 37–59 months or longer, while perinatal mortality was not.[16]

According to one study[17], low birth weight is the most frequent unfavorable result, occurring in 27 (21%) of the participants. In 25 (20%) of the patients, preterm birth is the second most common adverse outcome. Other documented outcomes include early neonatal mortality in 5 (4%) and stillbirth in 11 (9%) patients. These results demonstrate a robust association between newborn problems and short IPI. For the sake of mothers' and babies' health, they stress the significance of the ideal birth spacing. Previous research that examined a lot of metadata also reported similar results.[18,19]

Short IPI has been associated with higher neonatal mortality and morbidities in Pakistan, according to research by Murtaza K et al.[20] and Jameel et al.[21] Ethiopian women with short IPI also had higher preterm birth rates, according to Brhane et al.[22] and Jena et al.[23] The risks of short IPI are also influenced by maternal age. Fetal problems are more likely to occur in younger women. Low birth weight newborns were most common among women between the ages of 18 and 30, according to this study. These patterns demonstrate that outcomes are also significantly influenced by the age of the mother. Young mothers are more vulnerable to unfavorable fetal outcomes due to physiological frailty, immature reproductive systems, and socioeconomic issues.[24] Higher newborn mortality and underweight babies born to young moms with short IPI are also found in Indian studies.[25] In less developed nations, early

marriage and inadequate family planning are also major causes of short IPI.[26,27]

According to recent research, congenital abnormalities may be negatively impacted by short IPI. Air pollution and other environmental stresses raise these chances even more.[28] This study confirms that an ideal IPI (≥18 months, ideally ≥24 months) significantly lowers the chance of unfavorable outcomes. These results are consistent with rates in other low-resource settings.[29] It must be recognized that while the current study successfully illustrates the detrimental effects of brief IPI on fetal outcomes, the small sample size may limit the findings' ability to be broadly applied.

Nonetheless, it has been demonstrated that low birth weight newborns are associated with suboptimal interpregnancy intervals, and in order to improve perinatal outcomes, our society should take the required steps to increase the inter-pregnancy gap.

CONCLUSION

It is determined that a short period between pregnancies might considerably result in low birth weight, which can be prevented by extending the time between pregnancies. This can be accomplished by advising people to use effective contraception.

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