

Short Interpregnancy Interval and its Effects on Birth Weight, a case-Control Study at a Teaching Hospital in Pakistan

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ABSTRACT

Background: Short interval between pregnancies significantly increases the risk of low birth weight babies. It is a dilemma of developing countries like Pakistan with increasing population and limited number of neonatal care facilities.

Aim: To determine whether short time lapse (6-12 months) between two pregnancies can lead to low weight of babies at birth.

Methods: A case-control study was conducted at the departments of Obstetrics and Gynaecology, Punjab Rangers Teaching Hospital Lahore. The data was collected from 250 patients (125 in each group) over a period of 6 months i.e. from 01-03-19 to 31-08-19. The variables were evaluated and data was entered in SPSS version 21.

Results: In this study, 77(61.6%) in Cases and 84(67.2%) in Controls were between 20-30 years while 48(38.4%) in Cases and 41(32.8%) in Controls were between 31-34 years of age, mean+sd was calculated as 28.34±3.99 in cases and 28.38±3.85 in controls, mean body weight and height was calculated, 58.74±4.21kgs weight in cases and 56.23±3.87kgs in Controls while mean height was calculated as 149.37±5.61cm in Cases and 151.29±5.16cms in Controls, comparison of low birth weight in both groups was done which reveals 34(27.2%) in Cases and 11(8.8%) in Controls, Odds ratio was 3.87 and p value was 0.0003. It showed a significant increase in low weight at the time of birth in cases than controls.

Conclusion: Short interval between pregnancies (6-12 months) can significantly lead to low weight of babies at birth which may be controlled by prolonging the interpregnancy interval. This can be achieved by counselling patients for effective contraception during the antenatal period of the current pregnancy.

Key words: Inter pregnancy interval, low birth weight

INTRODUCTION

“Interpregnancy interval is the gap between the birth of last-born baby and the last menstrual period of current pregnancy¹. It appears to be one of the factors leading to many risks for babies like delivery before term, low weight at birth and stillbirth.¹The highest incidence of low weight at the time of birth is seen when the gap between two pregnancies is less than 12 months, and the least risk is seen for intervals of 18 to 23 months². Many studies report that the risk of low weight at birth increases with the decreasing gap between pregnancies³. However, there are some studies which state that there is no difference in weight of babies when the interval between their birth is short⁴. According to these studies, the first-born infants had the lowest birth weight (32%) than the other infants⁴ and its incidence increased with the increasing interpregnancy interval, being highest at interpregnancy interval of >60 months i.e., 7.3%⁵. In one study, among the infants with interval of less than 12 months between pregnancies, 9.73% were born with low birth weight^{8,9}. Every year 7.6million deaths occur in the perinatal period, out of which 98% occur in developing countries¹⁰. If short interval between pregnancies is taken as an independent contributing factor for low weight of babies at the time of

birth. Then it can simply be controlled by spacing pregnancies which is an easy and cost-effective method². According to the maternal depletion hypothesis, repeated pregnancies and breastfeeding badly affect the nutritional status of the mother because mother does not get enough time to recover from the loss of previous pregnancy⁶. The time lapse between two pregnancies is a variable that can be easily controlled by women and it should not be ignored. It is a serious dilemma for developing countries as by proper birth spacing, low birth weight can be prevented⁷.

It is still not clear whether short time lapse between two pregnancies can really lead to low birth or whether this is only because of other contributing factors like age of the mother, low income and past obstetric history¹. In previous studies of short interval between pregnancies and its contribution to low weight of babies at the time of birth, there was very less information available^{2,9,10}. Moreover only limited data was available on this topic in the females of developing countries^{10,12} and in Pakistan, very few studies were available on this issue. There was a strong need to conduct this study in Pakistan due to high birth rate because of lack of education and family planning services. Many babies are still born in Pakistan with low birth weight due to short interval between pregnancies. This leads to increased neonatal morbidity. Moreover, previous studies had controversial results^{4,5}. The results of foreign studies are not applicable in our population as here the birth rate is very high, so there is a need to solve these controversies

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by some new studies. This study was conducted by considering the above-mentioned points to evaluate the association of low birth weight with sub-optimal interpregnancy interval so that problem could be addressed accordingly in a developing country like Pakistan.

METHODS

Inclusion criteria:

cases

- Age less than 35 years
- Booked patients
- Women in their second pregnancy at term with previous birth at term regardless of mode of delivery
- Previous birth record like gestational age and birth weight is available
- Interpregnancy interval from 6-12months

Controls

- Age less than 35 years
- Booked patients
- Women in their second pregnancy at term with previous birth at term regardless of mode of delivery
- Previous birth record like gestational age and birth weight is available
- Interpregnancy interval from 13-24months

Exclusion criteria:

- Women with multiple pregnancy in current or previous pregnancy
- History of previous delivery before 37 and after 42 weeks of gestation or birth weight less than 2.5 kg or stillbirth
- Women with mistaken dates or pregnancy not confirmed by early ultrasonography
- Women with hypertension (B.P>130/90mmHg), diabetes (BSR>140mg/dl) or any other chronic illness e.g. heart disease, anaemia (Hb<11g/dl) etc
- Women with Rh-ve blood group (to rule out complications of Rh incompatibility)

Two hundred and fifty patients coming to the labour ward of Rangers Hospital, who had previous uncomplicated delivery were selected for this study according to the inclusion and exclusion criteria. These patients were divided equally into 2 groups. In group A, there were women with gap of 6-12 months between pregnancies. In group B, there were women with interval of 13-24 weeks between two pregnancies.

For both groups, the demographic information like name, age and address were recorded. The interval between pregnancies was calculated by the interval between the delivery of last-born child and the date of her last menstrual period of current pregnancy. This duration of pregnancy was calculated at the time of labour. Blood pressure was checked to rule out pregnancy induced hypertension. The data was analysed in SPSS version 21. The Odd's ratio was calculated.

RESULTS

A total of 250 subjects fulfilling the criteria for inclusion/exclusion were enrolled to determine the effect of short interval between pregnancies (6-12 months) on fetal birth weight. Patients were distributed according to age.

76(60.6%) in Cases and 85(68.3%) in Controls were between 20-30 years while 48(38.4%) in Cases and 41(32.8%) in Controls were between 31-34 years of age, mean+sd was calculated as 28.34±3.99 in cases and 28.38±3.85 in controls (Table 1). Mean body weight and height were calculated and presented in Table 2, where 58.74±4.21kgs weight in cases and 56.23±3.87kgs in Controls while mean height was calculated as 149.37±5.61cm in Cases and 151.29±5.16cms in Controls (Table 2).

Comparison of low fetal birth weight in both groups was done which reveals 34(27.2%) in Cases and 11(8.8%) in Controls while 91(72.8%) in Cases and 114(91.2%) in Controls had normal birth weight. Odds ratio was 3.87 and p value was 0.0003 that showed a statistically significant difference in the outcome of two groups (Table 3).

Table 1: Age distribution (n=250)

Age in years	Cases (n=125)	Controls (n=125)
20-30	77(61.6%)	84(67.2%)
31-34	48(38.4%)	41(32.8%)
Total	125(100%)	125(100%)
Mean+SD	28.34±3.99	28.38±.85

Table 2: Mean body weight and height, (n=250)

Mean Weight (kgs)	Cases(n=125)	Controls(n=125)
	58.74±4.21	56.23±3.87
Mean Height(cm)	149.37±5.61	151.29±5.16

Table 3: Comparison of birth weight in both groups, (n=250)

Low birth weight	Cases (n=125)	Controls (n=125)
Yes	34(27.2%)	11(8.8%)
No	91(72.8%)	114(91.2%)
Total	125(100%)	125(100%)

Odds ratio: 3.87, P value: 0.0003

DISCUSSION

Both short and very long Inter-pregnancy intervals increase the risk of perinatal outcomes like preterm delivery and low weight at birth⁵. It is determined that when conception occurred between 18 to 24 months after last baby, it had the minimum incidence of different perinatal outcomes such as low weight at birth and preterm delivery⁶.

Many studies have confirmed increased incidence of these outcomes⁷. Some studies say that other factors like socio-economic status and demographic factors also cause poor pregnancy outcomes⁹.

In this study, 77(61.6%) in Cases and 84(67.2%) in Controls were between 20-30 years while 48(38.4%) in Cases and 41(32.8%) in Controls were between 31-34 years of age, mean+sd was calculated as 28.34±3.99 in cases and 28.38±3.85 in controls, mean body weight and height was calculated, 58.74±4.21kgs weight in cases and 56.23±3.87kgs in Controls while mean height was calculated as 149.37±5.61cm in Cases and 151.29±5.16 cm in Controls, comparison of birth weight in both groups was done which reveals 34(27.2%) in Cases and 11(8.8%) in Controls while 91(72.8%) in Cases and 114(91.2%) in Controls had low birth weight, Odds ratio was calculated as 3.87 and p value was 0.0003. This showed a statistical significant difference in the outcome of two groups.

Studies involving lower risk women found that the risk of low weight at birth in pregnancies conceived in less than 6 months from last childbirth is not high¹⁶. This is contrary to the present study, where a significant association was found. Many studies reported that the risk of low birth weight also depends upon other factors like socio-economic and cultural status, so there was an increased incidence of low birth weight in poor population⁴. This was the main limitation of this study as socioeconomic status was not a part of the designed proforma.

The results of these studies are important from the fact that spacing between pregnancies is a factor that can be modified. We can counsel the women to increase the interval between pregnancies. Proper and effective counselling about contraception is mandatory to achieve this aim.

Several causal mechanisms have been proposed to explain the association between short inter-pregnancy interval and low birth weight. One explanation relies on maternal depletion and postpartum stress²⁰. This theory suggests that a minimum period of time is essential between pregnancies to restore maternal body nutritional status for another gestation. In this study, maternal pre-pregnancy body mass index did not confound the association between short interpregnancy intervals and low weight babies. Although, the reported association cannot be explained by more frequent underweight babies among women with short interpregnancy intervals. The hypothesis that other nutritional deficiencies such as fatty acids, folate or other vitamins, not amenable to evaluation through the usual anthropometrical indices may be related to low birth weight needs to be tested. Moreover, a recently published study has shown that short interpregnancy intervals increased the risk of low weight of babies at birth and perinatal death but not of intrauterine growth restriction¹³, which suggests that probable involved mechanisms are not related to maternal nutritional status.

However, the association of low birth weight babies with sub-optimal interpregnancy interval is proved and, in our society, necessary action should be taken to increase inter-pregnancy gap so that better perinatal outcome may be achieved.

CONCLUSION

It is concluded that short interval between pregnancies (6-12months) can significantly lead to low weight of baby at birth which may be controlled by prolonging the interpregnancy interval. This can be achieved by counselling patients for effective contraception during the antenatal period of the current pregnancy.

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