

Comparison of Perinatal Outcome (Low Birth Weight, Preterm Delivery) in Women with <6 Month Versus 12-17 Months of Interpregnancy Birth Interval

ANDLEEB ARSHAD¹, MISBAH KAUSAR JAVAID², ABIDA REHMAN³

¹Senior Registrar, Department of Obstetrics & Gynecology, Lahore General Hospital, Lahore

²Assistant Professor, Department of Obstetrics & Gynecology, Sir Gangaram Hospital FJMU Lahore

³Associate Professor, Obstetrics & Gynecology, Shaikh Zayed Hospital Rahim Yar Khan

Correspondence author: Dr. Andleeb Arshad, Email: andleebnadeem83@gmail.com, Cell: 03336734364

ABSTRACT

Objectives: To compare the perinatal outcome (low birth weight, preterm delivery) in women with <6 month versus 12-17 months of interpregnancy birth interval.

Material and methods: This Cohort study was conducted at Department of Obstetrics and Gynecology, Lahore General Hospital Lahore from March 2020 to September 2020. Total 420 patients with age range 18-40 years, singleton pregnancy, women with previous live birth, parity 1-4 and Gestational age > 28 weeks assessed on LMP were selected for this study. Patients were divided into two groups (A & B) according to their inter-pregnancy interval i.e. <6 months group labelled as A group and 12-17 months group labelled as B group. All patients in both groups will be followed till delivery and the perinatal outcome i.e. preterm delivery (birth occurred before completion of 37 weeks of gestation) and low birth weight (those babies whose weight less than 2.5 Kg at the time of birth) were noted.

Results: The mean age of women in group A was 26.73 ± 6.56 years and in group B was 26.73 ± 6.56 years. The perinatal outcome was preterm delivery in 189 (90.0%) and low birth weight babies in 143 (68.10%) women of <6 months while in 12-17 months interpregnancy interval, it was noted in 111 (52.86%) and 102 (48.57%) women respectively

Conclusion: Our study concluded that appropriate inter pregnancy interval could reduce the rate of preterm delivery and low birth weight babies and optimal interval associated with the lowest risk of adverse perinatal outcome was 12-17 months.

Keywords: Birth spacing, short interval, preterm delivery, low birth weight.

INTRODUCTION

The "inter pregnancy interval is defined as the amount of time between pregnancies. It is calculated between the date the last pregnancy ended and the date of the woman's last menstrual period".¹ Time between two pregnancies may have an impact on pregnancy complications. Women would be able to reduce the risk of such outcomes by having some control over the spacing between the pregnancies but in order for that, it is necessary to determine if interval between pregnancies is an independent biological risk factor.²⁻³ Although the causal mechanism between interpregnancy intervals and negative perinatal outcomes remains unknown, there are two schools of thought as to the underlying cause. The first asserts that interpregnancy intervals are a marker for social factors, such as marital status or socioeconomic status affect that ultimately cause poor outcomes.⁴ Alternately, some researchers have suggested that maternal nutrient depletion is the reason for negative perinatal outcomes after a short interpregnancy interval. Recent research has found that interpregnancy intervals that are either too short or too long are associated with negative perinatal outcomes.⁵ Variation in results of child mortality, infant, maternal morbidity and mortality have been keenly observed in studies including effect of pregnancy or birth spacing.⁶ A few researches show little or no association with short birth intervals, preterm birth, low birth rate and small for gestational age but several studies show positive relation with these outcomes, current researches are still being considered inconclusive.⁷⁻⁸ The risk of these outcomes

was lower in developed countries as compared to developing countries which had increased risks ranging from 1.2 to 3.0.⁸ The LBW outcomes were curvilinear with a high risk for the short and very long intervals in United States and India.⁹⁻¹⁰

In Pakistan, no study was conducted before, the results of the study would be helpful for creating awareness in general population as guide to maintain proper inter-pregnancy interval for the avoidance of poor perinatal outcome, further this study would be helpful for the obstetrician also to control the avoidable burden of patients by advising couples for ideal interpregnancy birth interval (12-17 months) for achieving good perinatal outcome.

MATERIAL AND METHODS

This Cohort study was conducted at Department of Obstetrics and Gynecology, Lahore General Hospital Lahore from March 2020 to September 2020. Total 420 patients with age range 18-40 years, singleton pregnancy, women with previous live birth, parity 1-4 and Gestational age > 28 weeks assessed on LMP were selected for this study. Women with multiple gestation pregnancy and women with high risk pregnancies (Diabetes, hypertension, Cardiac diseases) were excluded from the study.

Patients were divided into two groups (A & B) according to their inter-pregnancy interval i.e. <6 months group labelled as A group (< 6 months time elapsed from the last delivery date to last menstrual period of the index pregnancy) and 12-17 months group labelled as B group,

(12-17 months time elapsed from the last delivery date to last menstrual period of the index pregnancy) respectively.

After this, proper history and general physical examination was done in every patient. All patients in both groups will be followed till delivery and the perinatal outcome i.e. preterm delivery (birth occurred before completion of 37 weeks of gestation) and low birth weight (those babies whose weight less than 2.5 Kg at the time of birth) were noted. All this information was recorded on pre-designed proforma along with demographic profile of the patients.

Data was analyzed by using SPSS version 20. Mean and SD was calculated for numerical data and frequencies were calculated for categorical data.

RESULTS

Age range in this study was from 18 to 40 years with mean age of 26.77 ± 6.92 years. The mean age of women in group A was 26.73 ± 6.56 years and in group B was 26.73 ± 6.56 years. The mean parity in group A was 2.29 ± 1.08 and in group B was 2.37 ± 1.05.

Preterm birth was noted in 189 (90%) patients of study group A while in 111 (52.86%) patients of study group B. Difference of preterm delivery between <6 months group and 12-17 months group was significant (P = 0.000). In study group A, low birth weight babies were 143 (68.10%) while in group B were 102 (48.57%). Difference of low birth weight babies between the <6 months group and 12-17 months group was statistically significant (P = 0.000). (Table 1)

Four age groups were created i.e. 1: age group 18-25 years, 2: age group 26-30 years, 3: age group 31-35 years

and 4: age group 36-40 years. In age group 18-25 years, preterm delivery was noted in 65 (89.04%) patients of study group A while in 38 (55.07%) patients of study group B. Difference between the <6 months group and 12-17 months group was significant (P = 0.000). In age group 26-30 years, preterm delivery was noted in 51 (91.07%) patients of study group A while in 31 (52.54%) patients of study group and difference between both groups was (P = 0.000). In age group 31-35 years, preterm delivery was noted in 39 (92.86%) patient and 21 (46.67%) patients of study group A and B respectively. Difference was significant (P = 0.000). In age group 36-40 years, preterm delivery was noted in 34 (87.18%) patients and 21 (56.76%) patients respectively in study group A and B and difference was significant with p value 0.000. (Table 2)

In age group 18-25 years, low birth weight babies were 51 (69.86%) in group A while 34 (49.28%) in study group B and difference between the <6 months group and 12-17 months group was significant (P = 0.012). In age group 26-30 years, low birth weight babies were 39 (69.64%) in study group A while 28 (47.46%) in study group B and difference between the <6 months group and 12-17 months group was significant (P = 0.016). In age group 31-35 years, there were 27 (64.29%) low birth weight babies in study group A while 22 (48.89%) low birth weight babies in study group B but difference was not significant with p value 0.148. In age group 36-40 years, there were 26 (66.67%) low birth weight babies in study group A and 18 (48.65%) low birth weight babies in study group B but difference was insignificant (P = 0.112). (Table 3)

Table 1: Comparison of perinatal Outcome between both Groups

Group	Perinatal Outcome		Total	P value	Relative risk
	Yes	No			
Preterm Birth					
Group A <6 months	189 (90%)	21 (10%)	210	0.000	1.70
Group B 12-17 MONTHS	111 (52.86%)	99 (47.14%)	210		
Low Birth Weight					
Group A <6 months	143 (68.10%)	67 (31.90%)	210	0.000	1.40
Group B 12-17 MONTHS	102 (48.57%)	108 (51.43%)	210		

Table 2: Stratification of age of patients with respect to Preterm Delivery

Group	Preterm Delivery		Total	P value	RR
	Yes	No			
Age group 18-25 years					
A	65 (89.04%)	08 (10.96%)	73	0.000	1.616
B	38 (55.07%)	31 (44.93%)	69		
Age group 26-30 years					
A	51 (91.07%)	5 (8.93%)	56	0.000	1.73
B	31 (52.54%)	28 (47.46%)	59		
Age group 31-35 years					
A	39 (92.86%)	3 (7.14%)	42	0.000	1.99
B	21 (46.67%)	24 (53.33%)	45		
Age group 36-40 years					
A	34 (87.18%)	5 (12.82%)	39	0.000	1.536
B	21 (56.76%)	16 (43.24%)	37		

Among Para-1 group, preterm delivery was noted in 65 (87.84%) patients and 36 (55.38%) respectively in study group A and B and difference was significant with p value 0.000. Among Para-2 group, preterm delivery was noted in

57 (90.48%) patients of study group A while in 36 (53.73%) patients of study group B and difference between the <6 months group and 12-17 months group was significant (P = 0.000). Among Para-3 group, preterm delivery was noted

in 39 (90.70%) and 23 (50.0%) patients of study group A and B respectively and difference of preterm delivery between between the <6 months group and 12-17 months group was significant (P = 0.000). Among Para-4 group, there were 28 (93.33%) preterm deliveries in study group A while 16 (50.0%) preterm deliveries in study group B and difference between the <6 months group and 12-17 months group was significant (P = 0.000). (Table 4)

Among Para-1 group, low birth weight babies were 50 (67.57%) and 32 (49.23%) respectively in study group A and B and difference between the <6 months group and 12-17 months group was significant (P = 0.028). In Para-2

group, low birth weight babies were 45 (70.31%) and 31 (46.27%) respectively and difference between the <6 months group and 12-17 months group was significant (P = 0.004). In Para-3 group, in study group A, there were 30 (69.73%) low birth weight babies while in group B were 21 (45.65%) and difference between the <6 months group and 12-17 months group was significant (P = 0.022). Among Para-4 group, low birth weight babies were 18 (60%) and 18 (56.25%) respectively in study group A and B but difference between the <6 months group and 12-17 months group was not statistically significant (P = 0.765). (Table 5)

Table 3: Stratification of age of patients with respect to Low Birth Weight

Group	Low Birth Weight		Total	P value	RR
	Yes	No			
Age group 18-25 years					
A	51 (69.86%)	22 (31.14%)	73	0.012	1.417
B	34 (49.28%)	35 (50.72%)	69		
Age group 26-30 years					
A	39 (69.64%)	17 (30.36%)	56	0.016	1.467
B	28 (47.46%)	31 (52.54%)	59		
Age group 31-35 years					
A	27 (64.29%)	15 (35.71%)	42	0.148	1.314
B	22 (48.89%)	23 (51.11%)	45		
Age group 36-40 years					
A	26 (66.67%)	13 (33.33%)	39	0.112	1.370
B	18 (48.65%)	19 (51.35%)	37		

Table 4: Stratification of Parity with respect to Preterm Delivery

Group	Preterm Delivery		Total	P value	RR
	Yes	No			
Para-1					
A	65 (87.84%)	9 (12.16%)	74	0.000	1.58
B	36 (55.38%)	29 (44.62%)	65		
Para-2					
A	57 (90.48%)	6 (9.52%)	63	0.000	1.68
B	36 (53.73%)	31 (46.27%)	67		
Para-3					
A	39 (90.70%)	4 (9.30%)	43	0.000	1.81
B	23 (50.0%)	23 (50.0%)	46		
Para-4					
A	28 (93.33%)	2 (6.67%)	30	0.000	1.87
B	16 (50.0%)	16 (50.0%)	32		

Table 5: Stratification of Parity with respect to Low Birth Weight

Group	Low Birth Weight		Total	P value	RR
	Yes	No			
Para-1					
A	50 (67.57%)	24 (32.43%)	74	0.028	1.372
B	32 (49.23%)	33 (50.77%)	65		
Para-2					
A	45 (70.31%)	18 (29.69%)	63	0.004	1.544
B	31 (46.27%)	36 (53.73%)	67		
Para-3					
A	30 (69.73%)	13 (30.23%)	43	0.022	1.528
B	21 (45.65)	25 (54.35)	46		
Para-4					
A	18 (60%)	12 (40%)	30	0.765	1.067
B	18 (56.25%)	14 (43.75%)	32		

DISCUSSION

The relationship between interpregnancy interval and risk of preterm birth and low birth weight is well established. Our study was aimed to compare this perinatal outcome between short (<6months) and long (12-17 months) interpregnancy interval. In our study, the perinatal outcome was preterm delivery in 90.0% and low birth weight babies in 68.10% women with <6 months interpregnancy interval while in women with 12-17 months interpregnancy interval,

it was noted in 52.86% and 48.57% women respectively. A study conducted by Agustin Conde-Agudelo and colleagues¹¹ compared the birth outcomes, preterm birth was recorded in 95% patients with <6 months inter-birth interval while 56% in women with 12-17 months and low birth weight was recorded in 63% versus 51% respectively. In another study, same author concluded that there is an association between shorter interpregnancy intervals and adverse perinatal outcomes (low birth weight, pre-term

birth) than longer interpregnancy interval.⁶ Klerman LV et al¹² found decrease in preterm deliveries with increase in inter pregnancy interval. Zhu BP et al¹³ found higher rate of adverse perinatal outcomes in women having <3 months pregnancy interval. Al-Jasmi F et al¹⁴ in his case-control study in Emirati women has found short interpregnancy interval as a high risk factor for spontaneous preterm birth. Similar findings were also noted by Rodrigues T et al.¹⁵ In a study conducted by Conde-Agudelo A et al¹⁶ compared the birth outcomes, preterm birth was recorded in 40% in patients with <6 months inter-birth interval while 9% in women with 12-17 months and low birth weight was recorded in 35% versus 18% respectively. Interpregnancy interval shorter than 6 months was also found to be an increased risk for small for gestational age infants, low birth weight babies, preterm birth, early neonatal death and congenital malformations.¹⁷ Short (<6 months) interpregnancy interval was also found to be an independent risk factor for preterm delivery and neonatal death by Smith GCS et al.¹⁸

CONCLUSION

Our study concluded that appropriate inter pregnancy interval could reduce the rate of preterm delivery and low birth weight babies and optimal interval associated with the lowest risk of adverse perinatal outcome was 12-17 months.

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