

# Impact of Short Pregnancy Interval on Feto-Maternal Outcome in Women with Previous caesarean section

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## ABSTRACT

**Background:** Short inter-pregnancy interval has been associated with an increase risk of adverse pregnancy outcomes after caesarean section.

**Method:** A descriptive study, carried out in tertiary care hospital on total 63 numbers of women for a duration of six months with short inter-pregnancy interval and history of previous caesarean section.

**Results:** Among women with history of previous LSCS (n=63), mean age 26.5±4.6 years, gestational age 37.8±2.2 weeks, recommended IPI (>18 months) was observed only in 15.9% women. Most common indications for current C-section were irregular pain (20.6%), term women (12.7%), and fetal distress (11.1%). Occurrence rate of uterine scar dehiscence was 33.3%, preterm birth 19.0%, low birth weight 15.9%, and uterine rupture 3.2%. Frequency of uterine scar dehiscence was significantly higher in IPI ≤6 months than in >6 months (66.7% vs. 33.3%; p 0.040); and in IPI ≤12 months than in >12 months (81% vs. 19%; p 0.036). All two cases of uterine rupture were observed in IPI ≤6 months but the difference was not statistically significant. Frequency of preterm birth was significantly higher in IPI ≤18 months than in >18 months (66.7% vs. 33.3%; p 0.086).

**Conclusion:** We found elevated risk of uterine scar dehiscence, uterine rupture, low birth weight babies along with preterm births.

**Keywords:** IPI (Inter-pregnancy interval), LSCS (Lower Segment Cesarean Section), Scar dehiscence, Low Birth Weight.

## INTRODUCTION

Inter-pregnancy interval (IPI) is defined as the time lapsed between two consecutive pregnancies<sup>1</sup>. Although few studies have considered a short IPI when it is less than 6 months and long IPI when it is more than 5 years, IPI of 24 months is considered to be safe<sup>2</sup>.

Short inter-pregnancy interval is associated with multiple adverse effects on both mother and fetus. Like preterm births, low birth weight, low Apgar score, rupture of uterus, scar dehiscence and increased maternal morbidity and mortality. Women with short inter-pregnancy interval are also an increased risk of failure of (Vaginal birth caesarean section) VBAC and postpartum haemorrhage<sup>3</sup>.

The rising rate of Caesarean section is also a considerable issue. Women with previous caesarean section is at 60-70% risk for another caesarean section and complication rates are higher than the last procedure. Incomplete healing of the previous scar and a new conception leads to increase risk of scar dehiscence and uterine rupture. Short inter-pregnancy intervals (18 months or less) increases the risk of fetomaternal complications<sup>4,5</sup>.

The reasons behind the unfavourable maternal health effects of inter-pregnancy interval <6months are unknown, according to different theories maternal stress and maternal nutritional depletion may be one of the reason<sup>6</sup>. Previous studies in low income countries have shown that short IPI is associated with adverse perinatal, infant, child outcomes, preterm births and congenital anomalies<sup>7,8</sup>.

To date limited data available for impact of short IPI on fetomaternal outcome after caesarean section.

The aim of study was to determine the effects of short IPI on mother and fetus and to ensure that with proper birth spacing and optimization of Inter pregnancy interval healthy fetomaternal outcome can be achieved.

## MATERIALS AND METHODS

This descriptive study was conducted on total 63 patients in Obstetrics & Gynaecology Department of Sir Ganga Ram Hospital, Lahore, over a span of six months from January, 2021 to July, 2021. Patients with gestational amenorrhea from 34 weeks till 41 weeks,

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history of previous caesarean section with inter pregnancy interval <6months or >6 months were included in study after taking written informed consent.

**Data analysis procedure:** SPSS version 26.0 was used for data entry and analysis. Quantitative variables including age, gestational age, interpregnancy interval, and birth weight were reported as mean±standard deviation. Qualitative variables including indication for current C-section, GPA status, uterine scar dehiscence, preterm birth, low birth weight, and uterine rupture were reported as number and percentage. Comparison between different interpregnancy interval groups for the incidence of fetomaternal outcomes was performed using Pearson's Chi square test. Microsoft Excel clustered bar chart was used to present indications for current C-section. P-value ≤0.05 was considered as significant.

## RESULTS

The study population comprised of total 63 women who had a history of previous LSCS. Among indications for current C-section, the highest frequency 30.1% was obtained for irregular pain, followed by 12.7% term women, 11.1% fetal distress, and 9.5% for PROM. Other indications for current C-section (Fig. 1).

Table 1: Characteristics of study population

		n	%	Mean±SD
Age in years				26.5±4.6
Gestational age in weeks				37.8±2.2
Gravida	≤2	52	82.5	
	>2	11	17.5	
Parity	≤1	58	92.1	
	>1	05	7.9	
Abortus	<1	57	90.5	
	≥1	06	9.5	
Interpregnancy interval in months	≤6	29	46.0	3.8±1.1
	7-12	09	14.3	9.8±1.9
	13-18	15	23.8	15.7±1.9
	>18	10	15.9	41.3±24.9
Uterine scar dehiscence	Yes	21	33.3	
	No	42	66.3	
Uterine rupture	Yes	02	3.2	
	No	61	96.8	
Preterm birth	Yes	12	19.0	35.0±3.0
	No	51	81.0	39.0±1.0
Low birth weight	Yes	10	15.9	2.1±0.4
	No	53	84.1	3.0±0.3

The overall means of age and gestational age were  $26.5 \pm 4.6$  years and  $37.8 \pm 2.2$ , respectively. The frequencies of multigravida  $>2$ , multiparity  $>1$  and abortion  $\geq 1$  were 17.5%, 7.9% and 9.5%, respectively. The frequency of IPI  $\leq 6$  months was 46%. Only 15.9% women had IPI  $>18$  months. The descriptive analysis of adverse fetomaternal outcomes showed that 33.3% women had uterine scar dehiscence, 19% had preterm birth and 15.9% low birth weight. Only two women (3.2%) had uterine rupture. The details are shown in table 1.

Among maternal outcomes, the frequency of uterine scar dehiscence 66.7% in women with IPI  $\leq 6$  months was significantly higher than 33.3% in women with IPI  $>6$  months (p-value 0.040). The frequency of uterine scar dehiscence in women with IPI  $\leq 12$  months was also significantly higher than in women with IPI  $>12$

months (p-value 0.036). However, it was insignificantly different in women with IPI  $\leq 18$  months than in women with IPI  $>18$  months (p-value 0.474). Though all two cases of uterine rupture were observed in women with IPI  $\leq 6$  months but the difference was not significant between IPI groups. Among fetal outcomes, the frequency of preterm birth was not significantly different between IPI  $\leq 6$  versus IPI  $>6$  months (p-value 0.510) and IPI  $\leq 12$  versus IPI  $>12$  months (p-value 0.193). However, it was markedly higher 66.7% in women with IPI  $\leq 18$  months than 33.3% in women with IPI  $>18$  months (p-value 0.086). The frequency of low birth weight was also not different between IPI  $\leq 6$  versus IPI  $>6$  months (p-value 1.000), IPI  $\leq 12$  versus IPI  $>12$  months (p-value 0.500), and IPI  $\leq 18$  versus IPI  $>18$  months (p-value 0.189). The details are shown in table 2.

Figure 1: Indications for current cesarean section

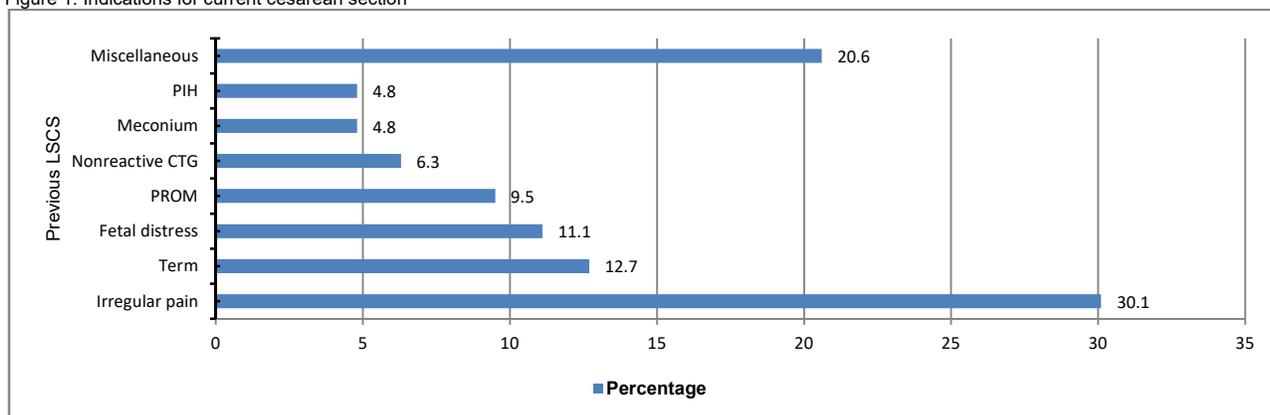


Table 2: Impact of Interpregnancy interval on fetomaternal outcomes

		Interpregnancy Interval											
		$\leq 6$ months		$>6$ months		$\leq 12$ months		$>12$ months		$\leq 18$ months		$>18$ months	
		n	%	n	%	n	%	n	%	n	%	n	%
Uterine scar dehiscence	Yes	14	66.7	07	33.3	17	81.0	04	19.0	19	90.5	02	9.5
	No	15	35.7	27	64.3	21	50.0	21	50.0	34	81.0	08	19.0
	p-value	0.040				0.036				0.474			
Uterine rupture	Yes	02	100.0	0	0.0	02	100.0	0	0.0	02	100.0	0	0.0
	No	27	44.3	34	55.7	36	59.0	25	41.0	51	83.6	10	16.4
	p-value	0.208				0.514				1.000			
P2reterm birth	Yes	04	33.3	08	66.7	05	41.7	07	58.3	08	66.7	04	33.3
	No	25	49.0	26	51.0	33	64.7	18	35.3	45	88.2	06	11.8
	p-value	0.510				0.193				0.086			
Low birth weight	Yes	05	50.0	05	50.0	05	50.0	05	50.0	07	70.0	03	30.0
	No	24	45.3	29	54.7	33	62.3	20	37.7	46	86.8	07	13.2
	p-value	1.000				0.500				0.189			

## DISCUSSION

In this study short IPI after cesarean section was associated with higher risk of preterm births, low birth weight, uterine scar dehiscence, and uterine rupture.

Association between IPI and adverse birth outcomes have been investigated by Hanley et al by comparing pregnancies between the two groups, one with short interpregnancy interval  $<6$  months and other with  $>6$  months interval and found that  $>40\%$  preterm birth in short IPI group<sup>10,11</sup>. In current study evidence of association were apparent for more preterm births with IPI  $<18$  months (66.7%) than (33.3%) in women with IPI  $>18$  months (P value 0.086). Another study by Grisarv-Granovsky et al found that women who conceived at shorten IPI had greater risk of preterm births<sup>12</sup>.

Adan et al found that women with short IPI were most likely to have low birth infants, compared to those whose IPI was more than 18 months<sup>13</sup>. Results not consistent with present study as frequency of low birth weight was not different between IPI  $<6$  months versus IPI  $>6$  months (P-value 0.000). IPI  $<12$  versus  $>12$

months (P-value 0.500) and IPI  $\leq 18$  versus IPI  $>18$  months (P-value 0.189).

It is interesting to note that our finding of lack of association between short IPI and small for gestational age and preterm births was consistent with results from the Canadian study conducted by class et al<sup>10</sup>. Another study by Klerman et al claimed that high impact of short IPI on pregnancy outcomes along with high rate of preterm births and low birth weight<sup>6</sup>.

The incidence of uterine scar dehiscence with previous caesarean ranges from 0.2 + 04.3%<sup>13</sup>. In current study it was found in upto 66.7% in women with IPI  $\leq 6$  months was significantly higher than 33% in women with IPI  $>6$  months (P-value 0.040). Results are consistent with another study conducted by Lewis P et al., found scar dehiscence upto 16% patients with previous caesarean section with short IPI<sup>3</sup>.

Another study reported scar dehiscence in 65% of patients with IPI  $<18$  months and in only 6.66% patients with IPI  $>24$  months<sup>14</sup>.

Current study showed two cases of uterine rupture in women with IPI  $\leq 6$  months, but the difference was not significant between

IPI groups. Shachbar BZ et al observed in study that short IPI do not permit adequate time to recover and heal from last caesarean section. Incision can lead to increase risk of uterine rupture<sup>15</sup>.

Our finding suggest for immediate need to take measures and interventions to educate Women to optimize IPI of 24-36 months to reduced associated fetomaternal complications.

## CONCLUSION

Our data add the knowledge to the existing literature describing optimal birth intervals with history of previous cesarean sections in relation to fetal and maternal outcomes. Effective counselling of woman and families who have sub optimal birth spacings is a current need. These results emphasize the mobilization of family planning services to optimize IPI in woman with previous caesarean sections to achieve healthy fetomaternal outcome.

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**Ethical approval:** The synopsis was approved by the ethical committee of Fatima Jinnah Medical University, Lahore.

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