

## Impact of inter pregnancy interval on outcome among pregnant women with history of miscarriage

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**Objective:** To determine the impact of inter-pregnancy interval (IPI) on outcome among pregnant women with history of miscarriage.

**Methodology:** This descriptive study was done from 27-January-2017 to 26-July-2017 and included 145 women with history of miscarriage and currently having pregnancy of greater than four weeks, confirmed by beta HCG levels, urine dipstick test or ultrasound. Inter-pregnancy interval and pregnancy outcome was noted.

**Results:** Mean age of patients was  $27.93 \pm 3.37$  years. Outcome of pregnancies was miscarriage, one (0.7%), live birth 127 (87.6%), perinatal death 18 (12.4%), pre-eclampsia 14 (9.7%), placental abruption 6 (4.1%), preterm delivery 28 (19.3%) and low birth weight 23

(15.9%). Women having IPI of 1 – 6 months had 39 (86.7%) live births, 0 (0%) miscarriage, 7 (15.6%) preterm deliveries, 5 (11.1%) low birth weight newborns, 3 (6.7%) preeclampsia and 2 (4.4%) had Placental Abruption while in women having the IPI of 12 – 18 months was seen in 30 (81.1%) live births, 1 (2.7%) miscarriage, 12 (32.4%) preterm deliveries, 10 (27%) low birth weight newborns. 4 (10.8%) preeclampsia and 1 (2.7%) had placental abruption.

**Conclusion:** There was no effect of IPI on live birth and miscarriage, while IPI of more than one year was associated with more chances of prematurity and low birth weight. There was no effect of IPI on placental abruption and pre-eclampsia.

**Keywords:** Pre-eclampsia, preterm delivery, stillbirth.

## INTRODUCTION

According to American College of Obstetricians and Gynecologists (ACOG), miscarriage is defined as the loss of pregnancy less than 20 weeks gestation.<sup>1</sup> First trimester miscarriage occurs below 12 weeks gestation and accounts for the majority of cases.<sup>2</sup> Miscarriage accounts for 30 – 50% of all the conceptions with increasing incidence seen with increasing maternal age.<sup>3</sup>

The Inter Pregnancy Interval (IPI) is one of the important risk factor for early miscarriage. IPI of six months before next conceptions helps to reduce both maternal and fetal complications.<sup>3</sup> Reported maternal complications after the miscarriage are pre-eclampsia 4.5%, placenta abruption 3.8%, labor induction 27.3% and cesarean delivery 18.5%.<sup>4</sup> IPI shorter than six months after a live birth is associated with increased incidence of induced abortions, stillbirths and miscarriage.<sup>5</sup>

The fetal complications after the miscarriage include fetal distress, low birth weight infants, preterm birth, still births, small for gestational age and dystocia.<sup>6</sup> The aim of our study was to determine the frequency of various outcomes in different IPI. This study may help to identify and highlight these health problems to secure the pregnancy outcome and awareness of the women

especially belonging to low socioeconomic status and having lack of knowledge of family planning.

## METHODOLOGY

This descriptive study was done with non-probability consecutive sampling technique from 27-January-2017 to 26-July-2017. A total of 145 women (age > 20 years and less than 35 yrs) with history of miscarriage and currently having pregnancy of greater than four weeks confirmed by beta HCG levels, urine dipstick test or ultrasound were recruited. Patients with twin pregnancy or triplets confirmed on ultrasound, IPI less than 4 weeks or > 24 months was excluded. Patients with history of smoking, alcoholism and any significance medical disorder like cardiac diseases, Hypertension, Diabetes Mellitus or thrombophilia was also excluded.

The sample size calculation was done by using WHO calculator, taking statistics of LWB as 7.15%, Margin of error = 4.2%. Data were collected from booked women admitted through emergency or outpatient department of Gynecology and Obstetrics of LUMHS Hospital. After explaining, the consent was taken from the patient.

Complete clinical examination and ultrasound abdomen was done. Women were followed for ante-natal, intra-partum and post-partum care and IPI and pregnancy

outcome were noted. Inter-pregnancy interval was defined as the duration in between preceding miscarriage and two weeks after date of last menstrual period.

**Statistical Analysis:** The statistical analysis was performed by using SPSS 20. The fetomaternal outcome was compared by chi-square test for IPI. Effect modifiers are age, BMI, educational status, Residency, parity, gravida. Post stratification chi-square test was applied.  $p < 0.05$  was considered as significant.

## RESULTS

A total of 145 women were recruited in the study. The demographic characteristics are shown in Table 1. Most of the women were multigravida and had multiparity. Inter pregnancy interval of the women is shown in Table 2. Most of the women were within 12 months pregnant

**Table 1: Descriptive statistics of patients.**

Characteristic	Mean	Standard Deviation
Age (Years)	27.93	3.37
Weight (kg)	72.37	14.23
Height (cm)	155.16	5.58
BMI ( $\text{kg/m}^2$ )	29.97	5.04
Gestational weeks	37.9	1.84

after last miscarriage. Outcome of pregnancies was miscarriage 1 (0.7%), live birth 127 (87.6%), death 18 (12.4%), pre-eclampsia 14 (9.7%), placental abruption 6 (4.1%), preterm delivery 28 (19.3%) and low birth

weight 23 (15.9%). Rate of placental abortion, pre-eclampsia, LBW, preterm, miscarriage and live birth was not statistically significant among different inter pregnancy interval as shown in Table 3.

**Table 2: Descriptive statistics of patients (n = 145).**

Characteristics	Number	%
Multi gravid	105	72.41%
Grand Multigravida	40	27.59%
<b>Parity Status</b>		
Primiparous	84	57.93%
Multiparous	61	42.87%
<b>Residential Status</b>		
Rural	38	26.27%
Urban	107	73.79%
<b>Inter Pregnancy Interval</b>		
01 – 06 months	45	31.03%
06 – 12 months	43	29.66%
12 – 18 months	37	25.52%
18 – 24 months	20	13.79%

Stratification analysis showed that outcome was not significant with age groups, BMI, gravid, parity, gestational age, residential status and education. Relationship between IPI and pregnancy outcome with respect to age, BMI, gravid, parity, gestational age, residential status and education had no effect of these modifiers. Outcomes with history of miscarriage by gestational age are shown in Table 4.

**Table 3: Frequency of various outcomes in different interpregnancy interval.**

Pregnancy Outcomes	Inter Pregnancy Outcome				P-Value
	1-6 Months (n = 45)	6 – 12 Months n = 43	12 – 18 Months n = 37	18 – 24 Months n = 20	
Placental abruption	2 (4.4%)	2 (4.7%)	1 (2.7%)	1 (5%)	0.966
Pre-eclampsia	3 (6.7%)	5 (11.6%)	4 (10.8%)	2 (10%)	0.870
LBW	5 (11.1%)	5 (11.6%)	10 (27%)	3 (15%)	0.187
Preterm	7 (15.6%)	6 (14%)	12 (32.4%)	3 (15%)	0.137
Miscarriage	0 (0%)	0 (0%)	1 (2.7%)	0 (0%)	0.401
Live Birth	39 (86.7%)	40 (93%)	30 (81.1%)	18 (90%)	0.432

**Table 4: Frequency of pregnancy outcomes in women with history of miscarriage by gestational age.**

Pregnancy Outcomes	Gestational Age (Weeks)		P-Value
	≤ 37 (n = 28)	> 37 (n = 117)	
Placental abruption	6 (21.4%)	0 (0%)	0.0005
Pre-eclampsia	11 (39.3%)	3 (2.6%)	0.0005
LBW	20 (71.4%)	3 (2.6%)	0.0005
Preterm	28 (100%)	0 (0%)	0.0005
Miscarriage*	1 (3.4%)	0 (0%)	0.200
Live Birth	11 (39.3%)	16 (99.1%)	0.0005

\*gestational age of miscarriage was 22 week which is included in group < 37 weeks.

## DISCUSSION

In early pregnancy, miscarriage is the most common complication.<sup>7</sup> Miscarriage rate is about 10% to 20% in documented pregnant women, while total rate is about 30% to 50%.<sup>8</sup> Risk of fertilization is about 10% in under 35 years old women, while in > 40 years old women it is about 45%. After the age of 30 years risk begins to increase.<sup>9</sup>

In our study, mean age of the patients was  $27.93 \pm 3.37$  years. Most of the women were multigravida as 72.4% were multi para and 27.5% were grand multi para. Miscarriage is associated with increased parity but number of live births decreases the chances of miscarriage. Miscarriage in nulliparous women is lower as compared to multiparous women, who may have a history of spontaneous abortion. Previous miscarriage can increase the risk of further miscarriage.<sup>10</sup>

Miscarriage may cause infection (48%), bleeding (21%) and embolism (11%), which if untreated can lead to further miscarriages.<sup>11</sup> Regarding frequency of various pregnancy outcomes among pregnant women with history of miscarriage in our study, miscarriage was 0.7%, perinatal death 12.4%, preterm delivery 19.3% and low birth weight 15.9%. We found 4.1% placental abruption in women with history of miscarriage. Women with antepartum hemorrhage due to placenta previa have the higher risk of miscarriage.<sup>12</sup>

In a study, those who conceived again within six months were more likely to have another miscarriage.<sup>13</sup> In another study, the associations between miscarriages in the previous pregnancy remained similar when adjusting for IPI.<sup>14</sup> In a systemic review, results were similar to our study, with an IPI of less than 6 months, the overall

risk of further miscarriage and preterm delivery were significantly reduced.<sup>15</sup> In an international study, IPI of 6 – 18 months was associated with 21% miscarriage while IPI < 3 months had 7.3% miscarriage.

Another study showed that, conception immediately after miscarriage was not associated with increased risk of miscarriage in the next pregnancy.<sup>16</sup> In a study from Bangladesh, short inter-outcome intervals after stillbirth, were associated with a high risk of a similar outcome in the next pregnancy.<sup>17</sup> Mothers with IPIs between 36 and 47 months had a negative effect of 150 g on birth weight of newborn compared with the mothers with an IPI < 12 months resulted in a decrease of 85 g on birth weight of newborn.

In our study, women having the IPI of 1 – 6 months had 3 (6.7%) preeclampsia and 2 (4.4%) had placental abruption, while in women having the IPI of 6 – 12 months had 5 (11.6%) preeclampsia and 2 (4.7%) had placental abruption. Women having the IPI of 12 – 18 months had 4 (10.8%) preeclampsia and 1 (2.7%) had placental Abruption. In a study, results were unsimilar to us; preeclampsia was significantly higher in women whose inter-pregnancy interval is more than 12 months.<sup>19</sup>

## CONCLUSION

There was no effect of inter-pregnancy interval on live birth and miscarriage, while inter-pregnancy interval of more than 1 years is associated with more chances of prematurity and low birth weight. There was no effect of inter-pregnancy interval on placental abruption and preeclampsia.

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