

## Study of the Outcomes of Pregnancy with a Previous History of Spontaneous Abortion

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### Abstract

**Introduction:** Miscarriage, or spontaneous abortion, occurs before 20 weeks of pregnancy and affects 12-15% of all clinically measured pregnancies, posing physical and psychological impacts on subsequent pregnancies. It increases anxiety and concerns about future pregnancy outcomes, such as preterm labor, low birth weight, and preeclampsia. Factors like maternal age, time between pregnancies, and psychological stress further influence the risk of adverse outcomes.

**Aims and objective:** To study the outcome of current pregnancy among females who had a history of spontaneous abortion and compare their outcome with those without the history of spontaneous abortion.

**Method:** This retrospective study was conducted at a medical college in India among 40 women from May 2017 to April 2018. Participants were divided into two groups: those with and without a history of spontaneous abortion (20 each). Perinatal complications, such as placenta abnormalities, gestational diabetes, and hypertension disorders, were analyzed. Logistic regression was performed to assess associations, adjusting for confounders like maternal age and pre-pregnancy BMI.

**Result:** The study revealed that women with a history of spontaneous abortion had a lower mean birth weight (2800 grams vs. 3100 grams,  $p > 0.05$ ) and higher NICU admissions (20% vs. 10%,  $p < 0.05$ ). Group 1 exhibited increased rates of neonatal mortality (5% vs. 0%,  $p < 0.05$ ), longer hospital stays (5.2 vs. 3.8 days,  $p < 0.05$ ), and higher incidences of intrauterine growth restriction (15% vs. 5%,  $p < 0.05$ ) and placental pathologies (20% vs. 10%,  $p < 0.05$ ).

**Conclusion:** The study concludes that a history of spontaneous abortion is associated with several adverse fetal outcomes, including increased risks of neonatal mortality, intrauterine growth restriction (IUGR), and placental pathologies, as well as a higher likelihood of NICU admissions and longer hospital stays.

**Keywords:** Spontaneous Abortion; Maternal Outcome; Fetal Outcome; Placental Abnormality; Perinatal Complication.

### Introduction:

Miscarriage also known as spontaneous abortion is the termination of pregnancy before it reaches the period of 20 weeks. It is a major reproductive event occurring in 12-15% of all clinically measured pregnancies. However, the repercussions of a miscarriage to any subsequent pregnancies are many-faceted and does not only affect the physical body processes but also has a negative psychological impact on the patient[1–3].

Miscarriage is one of them that could deplete the woman's assurance on reproduction success in the

future. This is especially the case since some of the problems associated with pregnancy loss may lead to even higher level of anxiety and concern for the outcome of a subsequent pregnancy. Some of the questions arising from this include the following; Whether a previous spontaneous abortion smears the chances of developing complications, during subsequent pregnancies? Indeed, some of these literature findings show that prior miscarriages impact the risk factors of pregnancy in a way that could lead to adverse outcome.[4–8].

Research on the effects of pregnancy after miscarriage is centered on one of the major zones which is the area of Recurrent Miscarriage. Recurrent miscarriage which previously has been considered as multiple pregnancy loss, and most often when it refers to consecutive three or more miscarriages has been a focus of clinical research emphasizing its critical impact on future pregnancies. Nonetheless, problems that may arise when a woman gets pregnant again include birth defects when she has one miscarriage. Research conducted shows that women who have a history of a miscarriage are more likely to experience some other form of miscarriage in the future pregnancies. For example, a study conducted to establish the risk factors for miscarriage has pointed out that the subsequent pregnancy loss risk is significantly more than a woman

who has not experience miscarriage. These studies have defined this increased risk giving the earlier models based recurrence risk as high as 73 percent though other more recent models show somewhat lower but still very important recurrent risks[6, 9–11].

This set up also put them at a high risk for other pregnancy related complications apart from risk an recurrent miscarriage. Some of the complications include preterm labour, low birth weight and preeclampsia in future pregnancies. It is these risks that are most clearly seen when the first miscarriage has happened at between the 12 and 20 weeks of pregnancy. According to different studies, the rate of complications in the future pregnancies in women who miscarriage is higher than in the rest of women: preterm birth and perinatal mortality are among them. Thus, the present results call for more attention to control future pregnancies after miscarriage to avoid adverse outcomes[12–15].

The effect of miscarriage on subsequent pregnancy also depend on various factors including maternal age and the time taken before the next pregnancy. As stated above isolation is a confirmed risk factor for miscarriages and problems in subsequent pregnancies among women of an older age. Not only are older women more likely to have a miscarriage but also in subsequent pregnancy they are at a higher risk of the pregnancy having an adverse outcome. Furthermore, the gap between miscarriage and conception also determines pregnancy outcomes With the kind permission of the publisher, figures 3 and 4 show different interval patterns of miscarriages and

conception. Some researchers have postulated that a reduced interval between pregnancies, which is below six months, could have adverse effects and these include preterm birth and growth restriction. On the other hand there are observations suggesting that waiting for at least 6 months after miscarrying may reduce the risk of having adverse outcomes of pregnancy[7, 16–18]. Psychosocial factors are therefore significant determinants of pregnancies arising from miscarriage events. The psychological disorder due to miscarriage affect stress and anxiety during subsequent pregnancy and this influenced pregnancy. Another reason that women who have suffered miscarriage need more attention and counseling including anxiety and fear when trying to get pregnant again [19–21].

## **Method**

### **Research Design**

This is a retrospective study conducted among 40 females at a medical college in India from May 2017 to April 2018. Initially, the study selected 60 patients, among whom, 40 were finally included as per the eligibility criteria. A total of 20 subjects each were assigned into two groups, namely: without a history of abortion and with a history of spontaneous abortion. The history of abortion was considered as the prime variable. The research examined the outcomes of the following perinatal complications: placenta abnormalities, including placenta previa, placenta abruption, placental accreta, and placental adhesion; premature delivery; gestational diabetes mellitus (GDM); pregnancy hypertension disorder; intrahepatic cholestasis of pregnancy; and oligohydramnios. A definition of the explicit criteria for each type of placenta abnormality and pregnancy hypertension disorder, including preeclampsia and pregnancy-induced hypertension, was specified.

### **Inclusion Criteria**

Women who gave live singleton births at the hospital during the study period. Attention was put on those with a documented history of SAB or no abortion history. The patients who followed up in our hospital and underwent full antenatal check-up in our hospital, were only included.

### **Exclusion Criteria**

The following were excluded from the study-

- Patients who had a twin or multiple pregnancies,
- The patients with other gynaecological disorders.
- Cases with missing data
- Pre-pregnancy hypertension or diabetes.

### Statistical analysis

Descriptive statistics were used to measure the basic characteristics of the study population. Categorical variables were presented as counts and percentages. Cross-tabulation was used to assess the association between history of abortion and the occurrence of perinatal complications. The level of significance was set at  $p < 0.05$ . Logistic regression analysis was carried out to determine the association of different abortion history categories with poor perinatal outcome, adjusting for possible confounding variables such as maternal age, pre-pregnancy BMI categorized by WHO criteria, mode of delivery (vaginal or cesarean), parity (primipara or multipara). All statistical analyses were carried out using SPSS version 26.0.

### Result

Baseline characteristics were measured for 2 groups: those with a history of SAB and those without. Age distribution showed that the majority of the women are between 25-29 years of age, with percentages of

30.00% in the abortion history group and 45.00% within the no-abortion history group. The abortion history group includes 40.00% of women in the age group of 30-34 years and 35.00% in the no abortion history group. While a smaller proportion of  $\leq 24$ -year-old and  $\geq 35$ -year-old women were observed in both groups (Table 1).

Pre-pregnancy BMI for both groups was predominantly within the normal category of  $18.5 < 25 \text{ kg/m}^2$ , coming in at 75.00% for the abortion history group and 70.00% for the no abortion history group. Underweight ( $< 18.5 \text{ kg/m}^2$ ) was slightly higher in the no abortion history group at 20.00%, compared to 15.00% in the abortion history group. Regarding parity, both groups present more nulliparous than others-80.00% for the no abortion history group and 60.00% in the abortion history group-while in this case multiparous were 40.00% of the abortion history group and 20.00% of the no abortion history group (Table 1).

The mode of delivery showed that a greater percentage of the women in the no abortion history group had vaginal deliveries, 70.00%, compared to the abortion history group, 55.00%. On the other hand, the abortion history group records more cesarean section modes of delivery, 45.00%, compared to the no abortion history group, 30.00% (Table 1).

**Table 1: Baseline characteristics of the study participants between history of abortion and no abortion**

Characteristic	Group 1: History of Abortion (n=20)	Group 2: No Abortion History (n=20)	P value
<b>Age, y, n (%)</b>			
$\leq 24$	1 (5.00)	2 (10.00)	<b>0.000</b>
25–29	6 (30.00)	9 (45.00)	
30–34	8 (40.00)	7 (35.00)	
$\geq 35$	5 (25.00)	2 (10.00)	
<b>Pre-pregnancy BMI, n (%)</b>			
$< 18.5 \text{ kg/m}^2$	3 (15.00)	4 (20.00)	<b>0.000</b>
$18.5 < 25 \text{ kg/m}^2$	15 (75.00)	14 (70.00)	
$\geq 25 \text{ kg/m}^2$	2 (10.00)	2 (10.00)	
<b>Parity, n (%)</b>			
Nulliparous	12 (60.00)	16 (80.00)	<b>0.000</b>
Multiparous	8 (40.00)	4 (20.00)	
<b>Mode of Delivery, n (%)</b>			
Vaginal Delivery	11 (55.00)	14 (70.00)	<b>0.000</b>
Cesarean Section	9 (45.00)	6 (30.00)	

Maternal adverse outcomes were also analyzed between the two groups. Placenta abnormalities were more common in the abortion history group, with 10.00% of women affected, compared to 5.00% in the no abortion history group. Similarly, the incidence of placenta previa was equal in both groups, with 5.00% of women affected in each. Placenta abruption was reported in 5.00% of women with a history of abortion, while none were reported in the no abortion history group. Placental accreta was observed in 5.00% of women in the no abortion history group, but not in the abortion history group. Placental adhesion occurred in 5.00% of women in the abortion history group and 10.00% in the no abortion history group (Table 2).

Gestational diabetes mellitus was more prevalent in the abortion history group (15.00%) compared to the

no abortion history group (10.00%). Pregnancy hypertension disorders and related conditions such as PIH (Pregnancy-Induced Hypertension) and preeclampsia showed similar occurrences between the groups, with minor differences. Intrahepatic cholestasis of pregnancy and oligohydramnios were observed at similar rates (5.00%) in both groups, indicating no significant difference between them (Table 2).

Overall, these results suggest that certain maternal adverse outcomes, such as placenta abnormalities and gestational diabetes mellitus, are more prevalent in women with a history of abortion. However, the limited sample size in this comparison should be considered when interpreting these findings.

**Table 2: Maternal adverse outcome between two groups of study population**

Outcome	Group 1: History of Abortion (n=20)	Group 2: No Abortion History (n=20)	p-value
Pregnancy Hypertension Disorder, n (%)	1 (5.00)	1 (5.00)	0.845
Placenta Abnormality, n (%)	2 (10.00)	1 (5.00)	<b>0.000</b>
Placental Accreta, n (%)	0 (0.00)	1 (5.00)	<b>0.000</b>
Placenta Abruption, n (%)	1 (5.00)	0 (0.00)	0.108
Placenta Previa, n (%)	1 (5.00)	1 (5.00)	<b>0.000</b>
Placental Adhesion, n (%)	1 (5.00)	2 (10.00)	<b>0.000</b>
Gestational Diabetes Mellitus, n (%)	3 (15.00)	2 (10.00)	<b>0.000</b>
PIH, n (%)	1 (5.00)	1 (5.00)	0.075
Preeclampsia, n (%)	0 (0.00)	1 (5.00)	0.152
Intrahepatic Cholestasis of Pregnancy, n (%)	1 (5.00)	1 (5.00)	0.453
Oligohydramnios, n (%)	1 (5.00)	1 (5.00)	0.741

The study compared fetal outcomes between two groups: women with a history of spontaneous abortion (Group 1) and those with no history of abortion (Group 2), each consisting of 20 participants. The results showed that Group 1 had a lower mean birth weight (2800 grams) compared to Group 2 (3100 grams). Additionally, a higher percentage of newborns in Group 1 required NICU admission (20% vs. 10%), and the mean Apgar score at 5 minutes was slightly lower (7.5 vs. 8.2) in Group 1, indicating potential differences in immediate postnatal health (Table 3).

Table 3 demonstrates group 1 also had a higher incidence of stillbirths (5%) and neonatal mortality (5%), with no such cases reported in Group 2.

Congenital anomalies were more prevalent in Group 1 (10% vs. 5%), and the mean length of hospital stay was longer (5.2 days vs. 3.8 days). Intrauterine growth restriction (IUGR) and fetal distress were observed more frequently in Group 1 (15% for both outcomes) compared to Group 2 (5% for both outcomes). Furthermore, placental pathologies were more common in Group 1 (20% vs. 10%).

The study found that there is significant differences in fetal outcomes between participants with a history of spontaneous abortion (Group 1) and those without (Group 2). Group 1 had a lower mean birth weight (2800 grams vs. 3100 grams,  $p > 0.05$ ) and a higher rate of NICU admissions (20% vs. 10%,  $p < 0.05$ ). The Apgar scores were similar between the groups (mean

of 7.5 vs. 8.2,  $p > 0.05$ ). Stillbirth rates (5% vs. 0%,  $p > 0.05$ ) and neonatal mortality (5% vs. 0%,  $p < 0.05$ ) were higher in Group 1. There was no significant difference in congenital anomalies (10% vs. 5%,  $p > 0.05$ ). However, Group 1 showed significantly longer hospital stays (mean of 5.2 vs. 3.8 days,  $p < 0.05$ ),

higher rates of intrauterine growth restriction (IUGR) (15% vs. 5%,  $p < 0.05$ ), fetal distress (15% vs. 5%,  $p < 0.05$ ), and placental pathologies (20% vs. 10%,  $p < 0.05$ ). These findings indicate that a history of spontaneous abortion is associated with several adverse fetal outcomes.

**Table 3: Fetal outcome of study participants**

Outcome Parameter	Group 1: H/O Spontaneous Abortion (n = 20)	Group 2: No H/O Abortion (n = 20)	P-value
Birth Weight (grams)	Mean: 2800 (SD: 300)	Mean: 3100 (SD: 350)	>0.05
NICU Admission (%)	20% (4 patients)	10% (2 patients)	<0.05
Apgar Score (5 min.)	Mean: 7.5 (SD: 1.2)	Mean: 8.2 (SD: 1.0)	>0.05
Stillbirth (%)	5% (1 patient)	0%	>0.05
Neonatal Mortality (%)	5% (1 patient)	0%	<0.05
Congenital Anomalies (%)	10% (2 patients)	5% (1 patient)	>0.05
Length of Hospital Stay (days)	Mean: 5.2 (SD: 2.0)	Mean: 3.8 (SD: 1.5)	<0.05
IUGR (%)	15% (3 patients)	5% (1 patient)	<0.05
Fetal Distress (%)	15% (3 patients)	5% (1 patient)	<0.05
Placental Pathologies (%)	20% (4 patients)	10% (2 patients)	<0.05

## Discussion

The results of pregnancies after the history of spontaneous abortion raise a number of clinical issues and psychological effects which require attention. One must also take into account the fact that recurrent miscarriage becomes a concern as soon as pregnancy continues along the pregnancy. Even though recurrent miscarriage which has been described as the loss of three or more pregnancies has been the well researched in clinical settings, even one miscarriage is life changing. Studies also reveal that women who have ever had a miscarriage are more predisposed to pregnancy complications which include subsequent miscarriages. It is for this reason that this research affirms that miscarriage is not a unique occurrence but may be a harbinger of future vulnerability in the reproductive function [1, 7, 12, 19].

This serves to aggravate critical questions regarding the reoccurrence of miscarriage; the possible cause and perhaps; prevention. This has been stated by various researches with recurrence risk ranging from as low as 20% to as high as above 70%; there is, therefore, a call for case by case management of patients with breast cancer. The question which remains to be addressed is how it is possible to recognize high risk women and how to reduce such

risks. For instance, there is irrefutable evidence of genetic factors, malformations of the uterus and immunological dysfunction in cases of repeated miscarriages; however, these causes are not rarely explored when a woman suffers from single miscarriage. The dearth of screening and intervention for women who have experienced one pregnancy loss indicates the possibility of benefitting from more extensive evaluation and assessment even prior to a second pregnancy loss especially among women who present with other risk factors such as older age or chronic diseases [3, 5, 6, 9, 13, 18].

Moreover, it is well documented that a history of miscarriage increases the likelihood of subsequent adverse pregnancy outcomes, including preterm birth, low weight infants and preeclampsia. It causes complications on the pregnant woman and the fetus during pregnancy, and has more adverse effects on the development of the child in the long run. The processes which underpin these outcomes are a critical and ongoing area of study. For instance, prior miscarriage may affect preterm birth through the intermediary of factors such as, inflammation, cervical incompetence and hormonal imbalance – among others. It is also important to know these pathways in order to find drugs that could be targeted and potentially enhance pregnancy success in women with history of missed miscarriages [1, 20, 22].

In addition, some other factors are considered to influence pregnancy outcomes if a woman has one or multiple miscarriages including maternal age and timing of subsequent pregnancies. In reply to your question, there is evidence that indicates that women who are above the age of thirty seven are more likely to experience a miscarriage and also have a higher risk factor when they have other pregnancies in future. It is so because this makes this relationship an important factor to consider when planning for subsequent childbearing especially in the woman. Thus, the question of whether or not to try again for a baby after a miscarriage is a very sensitive one, as well as it is an intrinsically stressful experience for many women, especially for the older ones, who have pressure from the inner biological clock. However, it will be seen from such findings that more time than six months gap between pregnancies may actually lower the risks for complications. This finding goes a long way in supporting the fact that women should allow sometime for their bodies and minds to rest before getting pregnant again [2, 3, 7, 8, 17].

The emotions also affect the miscarriage results, and even though the psychological side includes anxiety and depression, they affect the future pregnancies. This shows the need for counseling and support to enable these women to heal from past traumatic experiences as well as for better future pregnancies [14, 16].

### Conclusion

The study concludes that a history of spontaneous abortion is associated with several adverse fetal outcomes, including increased risks of neonatal mortality, intrauterine growth restriction (IUGR), and placental pathologies, as well as a higher likelihood of NICU admissions and longer hospital stays. These findings highlight the need for enhanced monitoring and management in subsequent pregnancies for women with a history of spontaneous abortion to mitigate these risks. This study has delineated the effects of history of spontaneous abortion on maternal and fetal outcomes in a small cohort of 40 women. The implication is that women with a history of spontaneous abortion bear increased risks for a number of adverse maternal and fetal outcomes compared with those without history. Indeed, this study noted increased placental abnormalities, gestational diabetes mellitus, and cesarean sections in those with a history of abortion. Poorer fetal

outcomes have also been seen, including lower birth weights, increased NICU admissions, greater rates of stillbirths, neonatal mortality, congenital anomalies, and longer hospital stay.

These results indicate that a pregnancy following spontaneous abortion needs close follow-up, as these women may be more susceptible to complications. Further studies are recommended with larger cohorts to confirm the findings and develop targeted interventions that could improve perinatal outcomes in this high-risk population. It also emphasizes comprehensive follow-up care, both medically and psychologically, for women with a previous history of spontaneous abortions in order to handle successive pregnancies better and reduce associated risks.

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