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RESEARCH ARTICLE

Impact of spontaneous abortion on subsequent obstetric outcome - a cohort study

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ABSTRACT

Background: Spontaneous abortion is a common complication during the initial periods of pregnancy, which has an impact on the subsequent pregnancies also. Hence this study was conducted to assess the obstetric outcome of mothers who had previous spontaneous abortion, with respect to their gravid and also to compare with those who has no history of spontaneous abortion. **Methods:** This cohort study was carried out in the Institute of Obstetrics and Gynecology at Madras Medical College, Chennai during October 2016 to October 2017. A total of 1000 cases with 500 patients with history of spontaneous abortion and 500 controls without history of spontaneous abortion were included in the study. The study was conducted using a proforma and data analysis was done using Statistical Package for Social Sciences. **Results:** Number of patients who reached full term among control group was 93.4% and cases were 64.6% ($p \leq 0.001$). The number of patients who had previous abortions had a significantly lesser chance of continuing the pregnancy to full term. Number of patients who delivered preterm among control group was 6.2% and among cases were 17.2% ($p \leq 0.001$). **Conclusion:** There was significant association between previous spontaneous abortion and preterm delivery, recurrence of abortion and PROM, in the subsequent pregnancies. There was no statistically significant increase in the rate of IUGR, still birth, IUD in the subsequent pregnancies. Thus careful surveillance is required in pregnancies following recurrent abortions, for early detection of complications.

Keywords: Spontaneous abortion, obstetric outcome, gravida.

A pregnancy that spontaneously stops before the foetus has reached a viable gestational age is referred to as a spontaneous miscarriage (fetal death before 24 weeks) [1]. A miscarriage will occur in about 1 in 5 clinical pregnancies, according to the majority of studies, although foetal loss rates in early pregnancy and conception research have been found to be close to one third [2 - 6]. About 3% of pregnancies result in recurrent abortions, which are characterized as two or more spontaneous sequential abortions [6]. The causes of spontaneous abortions vary widely, and in fewer than half of cases is a clear cause identified [7]. There have been reports of genetic abnormalities, anatomical diseases, hormone abnormalities, and thrombophilia as potential reasons [8].

Recurrent abortions, intrauterine growth restriction (IUGR) and preterm delivery are pregnancy problems that have recently been linked to spontaneous abortion [9 - 12]. However, relatively few researches have examined the relationship between the mother's gravidity and the obstetric outcome. Consequently, this study was carried out to evaluate the obstetric result of mothers who previously experienced spontaneous abortions, taking into account their gravid status.

Objectives: The objective of this study is to compare the obstetric outcome among mothers with and without previous history of spontaneous abortion, with respect to their gravid status.

Methods

This cohort study was carried out in the Institute of

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Obstetrics and Gynecology at Madras Medical College, Chennai during October 2016 to October 2017. In this study patients between age group of 18-35 years with history of spontaneous abortion, irrespective of cause and period of gestation were included. Patients with history of induced abortion, spontaneous abortion with twin gestation, PIH, chronic hypertension, GDM, juvenile DM, heart disease, anemia, carcinoma, HIV, HBsAG and VDRL were excluded from the study. A total of 1000 cases with 500 patients with history of spontaneous abortion (cases) and 500 controls without history of spontaneous abortion (controls) were included in the study.

Before the study got started, the ethical committee approved it. Prior to the study's start, the participants' written agreement was obtained after the primary investigator had discussed the study's goals to each one of them. Additionally, it was made clear to the participants that their participation was completely optional and that they could end the interview at any point without facing any repercussions. Every attempt was taken to ensure the confidentiality of all the participant data acquired. The patient's obstetric details and the outcome of their obstetric care during the current pregnancy were covered in the study utilising a proforma.

The study participants were contrasted based on their gestational status to test the hypothesis. Statistical Package for Social Sciences version 19 was used for data analysis. Two proportion Z test and Chi square test were used, appropriately. P value of <0.05 was considered statistically significant.

Results

In the present study, 58.8% and 58% of participants belonged to 21-25 years of age in cases and control group, respectively. In the age group of 26-30 years 30.8% and 26.9% of participants in cases and control groups, respectively. Also there were 6.2% and 5.3% of patients in the age group of 31-35 years in cases and control group respectively. Lastly, 4.2% and 9.8% of patients were in the age group of 18-20 years among the cases and controls, respectively. Mean age of cases and controls were reported as 26.02±3.34 years and 26.84±3.39 years, respectively and the difference in mean age between the groups was not significant.

In this study, 77.2% of the control group belonged to the second gravida and 75.6% of the cases group belonged to the second gravida. 9.4% of the control group belonged third gravida and 17.8 percent of the cases group belonged to third gravida. The distribution of gravidas among controls and cases did not differ significantly. Out of the 500 cases studied there were 76.4% of patients having one abortion, 17.2% of patients having two abortions, 4.2% of patients with 3 abortions and 2.2 percent of patients with 4 abortions.

Table 1: Comparison of obstetric outcome between cases and controls.

Outcome	Controls		Cases		P value
	N	%	N	%	
Full term	467	93.4	323	64.6	<0.001*
Post term	3	0.6	10	2.0	0.050
Pre term	31	6.2	86	17.2	<0.001*
PROM	57	11.4	159	31.8	<0.001*
IUGR	7	1.4	17	3.4	0.123
Still birth	0	0	1	0.2	1.000
IUD	10	2.0	16	3.2	0.233
Abortion	0	0	81	16.2	<0.001*

*Significant

The number of patients who reached full term among control group was 93.4% and cases were 64.6%. The difference is statistically significant <0.001. The number of patients who had previous abortions had a significantly lesser chance of continuing the pregnancy to full term. The number of patients who delivered preterm among control group was 6.2% and among cases were 17.2%. This is statistically significant (table 1).

Table 2: Comparison of obstetric outcomes between G2A1 (cases) and G2P1L1 (control)

Outcome	Control (G2P1L1) (N=386)		Cases (G2A1) (N=378)		P value
	N	%	N	%	
Full term	359	67.1	268	70.9	0.256
Preterm	27	6.9	68	17.9	<0.001*
IUGR	6	1.5	11	2.9	0.204
PROM	45	11.7	126	33.3	<0.001*
Post term	2	0.5	10	2.6	0.018*
Still birth	0	0.0	0	0.0	-
Abortion	0	0.0	33	8.7	<0.001*

*Significant

Among the G2 mothers, 70.9% of patients belonging to the cases group had full term deliveries, 67.1% of patients belonging to the control group had full term deliveries. 33.3% had PROM among cases group whereas only 11.7% of patients belonging to the control group had PROM (p<0.001) which is statistically significant. 8.7 percent of patients of patients belonging to the cases group had abortions and none had an abortion among control group p<0.001 statistically significant. 17.9% of patients belonging to the cases group had preterm deliveries whereas only 6.9% of patients belonging to the control group had preterm deliveries (p<0.001) which is statistically significant. The percentage of IUGR, still births between the two groups did not differ significantly. This shows that even patients having one previous abortion have significantly higher chances of preterm births, PROM and abortion in the subsequent pregnancy (table 2).

Among the G3 mothers, 94.8% of patients belonging to the control group had reached full term whereas only 50.6% of patients belonging to the cases group had reached full term, p<0.001 which is statistically significant 17.9% of patients belonging to the cases group had preterm delivery whereas only 3.1% of patients belonging to the control group had preterm delivery, p<0.001 which is statistically significant. 31.5% of patients belonging to the cases group had PROM whereas only 8.2% of patients belonging to the control group had PROM, p<0.001 which is statistically significant. 30.3% of patients belonging to the cases group had abortions and there were no abortions among the control group, p<0.001 which is statistically significant. 5.6% of patients belonging to the cases group had IUGR and none belonging to the control group had IUGR, p<0.024. Post-term birth, and still birth were not significantly different between the two groups (table 3).

Table 3: Comparison of obstetric outcomes between G3A2 (cases) and G3P2L2 (control).

Outcome	Control (G3P2L2) (N=97)		Cases (G3A2) (N=89)		P value
	N	%	N	%	
Full term	92	94.8	45	50.6	<0.001*
Preterm	3	3.1	16	17.9	0.001*
IUGR	0	0	5	5.6	0.024*
PROM	8	8.2	28	31.5	<0.001*
Post term	1	1	0	0	0.337
Still birth	0	0	0	0	-
Abortion	0	0	27	30.3	<0.001*

*Significant

Among the G4 mothers, 90% of patients belonging to the control group had full term deliveries whereas only 31.8% of patients belonging to the cases group had full term deliveries, p<0.002 which is statistically significant. 63.8% of patients belonging to the cases group had abortions whereas none of the patients belonging to the control group had abortions, p<0.001 which is statistically significant. Preterm, IUGR, PROM, post term still birth did not differ significantly between the two groups (table 4).

Table 4: Comparison of obstetric outcomes between G4A3 (cases) and G4P3L3 (control).

Outcome	Control (G4P3L3) (N=10)		Cases (G4A3) (N=22)		P value
	N	%	N	%	
Full term	9	90.0	7	31.8	0.002*
Preterm	1	10.0	1	4.5	0.534
IUGR	1	10.0	1	4.5	0.534
PROM	2	20.0	2	9.1	0.537
Post term	0	0	0	0	-
Still birth	0	0	0	0	-
Abortion	0	0	14	63.6	<0.001*

*Significant

Among the G5 mothers, all mothers belonging to the control group had full term deliveries and only 27.3% of patients belonging to the cases group had full term deliveries, p<0.004 which is statistically significant. 63.6% patients belonging to the cases group had abortions whereas there were no abortions in the control group, p<0.013 which is statistically significant. Preterm, IUGR, PROM, post term still birth were not differ significantly difference between the two groups (table 5).

Table 5: Comparison of obstetric outcomes between G5A4 (cases) and G5P4L4 (control)

Outcome	Control (G5P4L4) (N=7)		Cases (G5A4) (N=11)		P value
	N	%	N	%	
Full term	7	100.0	3	27.3	0.004*
Preterm	0	0	1	9.1	1.000
IUGR	0	0	0	0	-
PROM	2	18.2	3	27.3	1.000
Post term	0	0	0	0	-
Still birth	0	0	0	0	-
Abortion	0	0	7	63.6	0.013*

*Significant

Discussion

On compare the obstetric outcome between the controls and the cases in this study, number of patients who reached full term among control group was 93.4% and cases were 64.6%. The difference is statistically significant (<0.001). The number of patients who had previous abortions had a significantly lesser chance of continuing the pregnancy to full term. Number of patients who delivered preterm among control group was 6.2% and among cases were 17.2%. This is statistically significant. Similar research by PW Reginald et al [13] shown that 28% of individuals experiencing preterm birth had previously had more than three abortions. According to Olga Basso et al [14] the abortion cohort has a higher incidence of premature births than the reference cohort.

About 11.4% of patients in the control group and 31.8% of patients in the cases developed PROM. It was determined that the difference was statistically significant. Similar research conducted by Monochithra et al [15] revealed that previous preterm deliveries, abortions, and prematurity all increase the risk for subsequent preterm births with or without PROM in their study, "Previous pregnancy outcome and subsequent risk to preterm rupture of amniotic sac membranes." There was no statistical difference between the two groups in terms of the percentage of patients with IUGR, which was 3.4% in the current cases group and was higher than 1.4% in the control group (p=0.123). While David et al[16] study demonstrated that the risk of IUGR and low birth weight increases with the number of abortions, reaching 4.9% with one prior spontaneous abortion and 9.5% with three or more.

While the other studies could not demonstrate this, Thom et al [17] and Mortius et al [18] demonstrated that miscarriage may increase the risk of premature labour in the subsequent pregnancy [19]. IUFD and prior spontaneous abortion rates have increased, according to Goldernburg et al [20] and Funderburk et al [21].

Conclusion

According to the current study, having an unfavourable pregnancy outcome increases the likelihood of having an unfavourable pregnancy outcome in the future. Recurrence of abortion and PROM are associated with premature birth, previous spontaneous abortion, and future pregnancies. In the succeeding pregnancies, there was no statistically significant increase in the rate of IUGR, stillbirth, or IUD. Additionally, the likelihood of a successful outcome declines as the number of prior abortions rises. This study's remarkable finding is that women with a history of prior abortions had considerably greater rates of preterm birth, PROM, and abortion than those without a history of abortions. The results of the current and earlier studies indicate that additional research with sufficient sample sizes and controlling for intervening factors is needed to examine pregnancy outcomes following either a prior spontaneous or a late abortion. Pregnancies after recurrent abortions need to be carefully monitored to allow for the early identification of problems.

Conflict of interest: None. **Disclaimer:** Nil.

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