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Original Research Article

An obstetric outcomes in women with and without one previous spontaneous abortion: a comparative study

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ABSTRACT

Background: Spontaneous abortion is defined as the spontaneous loss of pregnancy before the foetus reaches viability. Two key factors associated with an increased risk of miscarriage are a woman's age and a history of previous miscarriages. Studies suggest that a history of miscarriage may raise the risk of PIH, FGR, PROM, threatened abortion, preterm labour, low birth weight, etc. in subsequent pregnancies. Hence, pregnancies with prior history of spontaneous abortions should be considered as high-risk pregnancies and effective precautions are to be taken.

Methods: A case-control study was undertaken on 52 cases and 52 controls to evaluate and compare the adverse outcomes in women who had a single previous spontaneous abortion immediately preceding the present pregnancy (cases) and those who haven't (controls).

Results: 86.54% of cases were booked and only 65.38% from controls were booked. Antenatal factors strongly associated with previous spontaneous abortion are FGR, threatened abortion and PROM. LSCS was the most common mode of delivery in both groups suggesting that previous abortion did not become an indication of LSCS in case group. 65.12% of patients who received progesterone support reached full-term.

Conclusions: Women with a history of previous one spontaneous abortion are at an increased risk of developing complications in the next pregnancy. Adverse complications and foetal loss can be reduced by giving proper antenatal care in terms of increased awareness, early antenatal care initiation and effective timely intervention, like in this scenario, use of progesterone support and its usage was observed to be a boon.

Keywords: Antenatal high risk factors, Previous spontaneous abortions, PROM

INTRODUCTION

Abortion is the termination of pregnancy by removal or expulsion of an embryo or foetus.^{1,2} Spontaneous abortion is defined as the spontaneous loss of pregnancy before the foetus reaches viability. The term therefore includes all pregnancy losses from the time of conception until 24 weeks of gestation (RCOG) or up to a foetal weight of 500g (WHO).

The American College of Obstetricians and Gynecologists (ACOG) identify miscarriage as the leading cause of pregnancy loss, affecting upto 26% of all pregnancies.³

According to recent data from the National Family Health Survey (NFHS), which was carried out between 2019 and 2021 in India, miscarriages occurred in approximately 7% of pregnancies.⁴

A prior history of pregnancy loss increases the risk of recurrent pregnancy loss, with the risk increasing after each additional loss. Studies suggest that a history of miscarriage may raise the risk of PIH, foetal growth restriction, PROM, threatened abortion, preterm labor, low birth weight, low APGAR scores, and Downs syndrome (even in young mothers), in subsequent pregnancies.⁵ Hence, pregnancies with a prior history of spontaneous

abortion should be considered high-risk pregnancies and effective precautions are to be taken.

Only a handful of studies were found in the literature about non-recurrent or single pregnancy loss and its association with adverse pregnancy outcomes in immediate subsequent pregnancy. This study focuses on the same and evaluates the same.

This study aimed to compare the maternal outcome between women following one immediate previous spontaneous abortion and in women without any previous spontaneous abortion. Also, to study its effect on neonatal outcome among the two groups.

METHODS

This study was case control study conducted in the Department of Obstetrics and Gynaecology, MGM Medical College and Hospital, Chhatrapati Sambhajanagar, Maharashtra, India. This study conducted from October 2022 to 2024.

Selection criteria

The study included pregnant women with singleton pregnancies. Cases were defined as pregnant women with a history of one previous spontaneous abortion, while controls were pregnant women with no prior history of spontaneous abortion.

Procedure

This case- control study was undertaken on 52 case and 52 controls to evaluate and compare the adverse obstetric outcomes in women who had a single previous spontaneous abortion immediately preceding the present pregnancy (cases) and those who haven't (controls). All pregnant women coming to Labor room and Antenatal ward for confinement followed by delivery were included in the study.

Ethical consideration

Ethical approval has been taken from the Ethical Committee, MGM Medical and Hospital, Chhatrapati Sambhajanagar.

Statistical analysis

Data was entered in Microsoft excel and analysed using SPAA version 24.0th. Data was presented in the form of tables and visual impressions like bar diagrams, etc. P value of <0.05 was considered statistically significant.

RESULTS

In the case group, 76.92% had a previous spontaneous abortion while only 23.08% had a missed abortion in their previous pregnancies (Table 1).

Table 1: Type of abortion in case group.

Type of abortion	Case group (n=52)	
	No.	Percent
Spontaneous abortion	40	76.92
Missed abortion	12	23.08
Total	52	100.00

In our study, in both cases and controls, majority 84.62% and 86.54% respectively belonged to the age group 20-29 years which is the common age group of ANC patients who come to our institute. 3.85% of cases were second gravid despite of the age being ≤ 19 years (Table 2).

Table 2: Age-wise distribution.

Age (years)	Case group (n=52)		Control group (n=52)		Total	
	No.	Percent	No.	Percent	No.	Percent
≤ 19	2	3.85	1	1.92	3	2.88
20-29	44	84.62	45	86.54	89	85.58
≥ 30	6	11.54	6	11.54	12	11.54
Total	52	100.00	52	100.00	104	100.00

Chi-square test: $\chi^2=0.345$, df=2, p=0.842; not statistically significant

This demonstrates that 90.38% of cases were from urban areas and 9.62% were from rural areas. While from the control group, almost equal numbers of patients belonged to urban and rural localities, indicating increased reach of awareness regarding early antenatal care initiation among women in urban localities with previous pregnancy losses (Table 3).

Table 3: Region-wise distribution.

Region	Case group (n=52)		Control group (n=52)		Total	
	No.	Percent	No.	Percent	No.	Percent
Rural	5	9.62	22	42.31	27	25.96
Urban	47	90.38	30	57.69	77	74.04
Total	52	100.00	52	100.00	104	100.00

Chi-square test: $\chi^2=14.457$, df=1, p=0.0001; Significant

In our study, the majority of participants in both groups were within normal BMI-59.62% in the case group and 71.15% in the control group. The prevalence of pre-obesity (25-29.9 BMI) was higher in the case group (34.63%) as compared to the control group (21.15%). 5.77% in the control group were morbidly obese which could be a coincidental finding. These above findings suggest that there was no association between previous abortion and BMI (Table 4).

The case group had a significantly high proportion of participants with one or more antenatal complications compared to the control group. Mainly among the case

population, FGR was present in 30.77% and PROM in 21.15% which were insignificantly higher proportions when compared to control group population. Signs and symptoms of threatened abortion were experienced by 25% of cases as compared to only 9.62% of controls.

Table 4: BMI-wise distribution.

BMI	Case group (n=52)		Control group (n=52)		Total	
	No.	Percent	No.	Percent	No.	Percent
≤18.5	0	0.00	1	1.92	1	0.96
18.5-24.9	31	59.62	37	71.15	68	65.38
25-29.9	18	34.62	11	21.15	29	27.88
30-34.9	3	5.77	0	0.00	3	2.88
≥35	0	0.00	3	5.77	3	2.88
Total	52	100.00	52	100.00	104	100.00

Table 5: Distribution of antenatal factors.

Antenatal factors	Case group		Control group	
	No.	Percent	No.	Percent
No antenatal factors	10	19.23	29	55.77
PIH	3	5.77	4	7.69
GDM	3	5.77	0	0.00
Anemia	14	26.92	18	34.61
Hypothyroidism	2	3.85	5	9.62
Post-datism	8	15.38	6	11.54
Threatened abortion	13	25.00	5	9.62
PROM	11	21.15	3	5.77
FGR	16	30.77	6	11.54
Oligohydramnios	5	9.62	5	9.62
Polyhydramnios	4	7.69	1	1.92

LSCS (Caesarean section) was the most common mode of delivery in both groups in our institute (71.15% in the case group and 67.31% in the control group); Normal vaginal delivery was less frequent, occurring in 28.85% of the case group and 30.77% of the control group. Previous abortion did not become indication of LSCS in case group in our institute (Table 6).

Table 6: BMI-wise distribution.

Mode of delivery	Case group (n=52)		Control group (n=52)		Total	
	No.	Percent	No.	Percent	No.	Percent
Vaginal	15	28.85	16	30.77	31	29.81
Instrumental	0	0.00	1	1.92	1	0.96
LSCS	37	71.15	35	67.31	72	69.23
Total	52	100.00	52	100.00	104	100.00

Total 65.12% of patients who received progesterone support reached term and 88.89% were not given progesterone support landed in preterm labor indicating importance of progesterone support. This is analyzed to be

Surprisingly, control group had greater proportion of patients with anemia 34.61% when compared to case group, stating that the persistence of anemia is remotely related or not related to previous abortion (Table 5).

statistically significant. Similarly, progesterone support for pure tocolytic purposes given in indicated women of both cases and controls is of vital significance (Table 7).

Table 7: Progesterone support in cases group.

Progesterone support	Case group (n=52)				Total	
	Pre-term		Full-term		No.	Percent
	No.	Percent	No.	Percent	No.	Percent
Given	1	11.11	28	65.12	29	55.77
Not given	8	88.89	15	34.88	23	44.23
Total	9	100.00	43	100.	52	100.00

Chi-square test: $\chi^2=8.8$, df=1, p=0.003; Significant

DISCUSSION

Age distribution

In the present study, 85.58% were from the age group 20-29years, this being the most common age group of antenatal patients reaching our institute.

Sahu et al (2014), in his study shared that majority of patients (34.3%) were in the age group of 25-29 years.⁶

A similar study by Agarwal et al (2014) reported that in her study, 57.1% of subjects belonged to the age group 21-25 years.⁷

Geographical distribution

This study is consistent with Muzaffar et al (2020), in which 58.58% of patients with previous abortions belonged to urban localities.⁸

This could be due to an increase in the number of antenatal visits among patients who had a previous pregnancy loss and increased awareness among antenatal women living in urban areas. Hence, health extension programs on early Antenatal care initiation should be strengthened in rural areas.

Body mass index

Our findings support a potential link between pre-obesity (BMI 25-29.9 kg/m²) and an increased risk of spontaneous abortion. This aligns with the findings of Sun et al (2020), who reported a statistically significant association between high BMI and increased risk of spontaneous abortion (OR 1.48).⁹

Antenatal high-risk factors

Among cases and controls, there was no difference in the number of patients with pre-eclampsia (5.77% in cases and 7.69% in controls), GDM (5.77% and 0%) and anemia (26.92% and 34.61%).

Pre-eclampsia

There are conflicting results by various authors. In a study conducted by Kashanian et al (2006), there was no significant difference in the number of patients having preeclampsia in the case group (3.5%) and in the control group (3.5%).¹⁰

But in conflict with the above studies Bhattacharya et al (2008) studied that in comparison with women who had a previous delivery; women with an initial miscarriage were 3.3 times more likely to suffer from pre-eclampsia.¹¹

Gestational diabetes mellitus

Chandana et al (2015), 3.2% of cases with previous spontaneous abortion had gestational diabetes mellitus but this is almost similar to the number in control groups. There was no statistically significant difference.¹²

Fetal growth restriction

In the present study, majority 30.77% of cases had FGR when compared to only 11.54% among controls who had FGR.

In the study by Weintraub et al (2011), 3.3% of patients with initial miscarriage had FGR and 2.1% of patients with no initial miscarriage had FGR. This was found to be statistically significant.¹³

In contrast to the above studies, in a study by Bakshi et al (2015), there was no significant difference in FGR rates between patients with and without a history of spontaneous abortion.¹⁴

Premature rupture of membranes

In the present study, a higher proportion of patients in the study group (21.15%) experienced PROM compared to the control group (5.77%).

In a study by Chandna et al (2015), 19.1% of patients with previous spontaneous abortion had PROM when compared

to 7.2% in primigravida and 5.6% in second gravida without any history of spontaneous abortion. This was statistically significant.¹²

In conflict with the above studies, in a study conducted by Kashanian et al (2006), there was no individual association between PROM and previous spontaneous abortion. In his study, there were 13.5% and 24% of patients with PROM in the case group and control group respectively.¹⁰

Threatened abortion

In the present study, 25% of cases experienced symptoms of threatened abortion (vaginal spotting or bleeding) during the irantenatal period when compared to only 9.62% of controls who experienced.

This was consistent with Bishnoi et al (2019), who found that 16% of her cases and 8% of controls had threatened abortion in their present antenatal period and this was found to statistically significant.¹⁵

But in contrast to the above studies, a study by Sreeneha et al (2023), showed no statistically significant association between history of abortions with threatened abortions in current pregnancy.¹⁶

Outcome with progesterone support

In our study in the case group, 29 patients were given progesterone support (due to various obstetric indications) only 3.4% of these patients underwent preterm delivery while rest 96.55% had full-term deliveries.

In our institute, progesterone support is regularly given to indicated patients and seems to have benefited majority of them.

In a study by Zhao et al (2023), results indicated that progesterone probably increases live births in women with a prior history of spontaneous abortion with an absolute increase of 4.4% of live births.¹⁷

Mode of delivery

In the present study, the most frequent mode of delivery in both the case group and control group was caesarean section (LSCS)-71.15% and 67.31% respectively and no significant association was found between previous abortion and incidence of LSCS.

But, in a study by Kashanian et al (2006), 28.14% in the case group underwent LSCS when compared to only 13.48% in the control group, concluded to be statistically significant.¹⁰

The limitations of the study were that the sample size was less.

CONCLUSION

To conclude, women with a history of previous one spontaneous abortion are at an increased risk of developing complications in the next pregnancy. Adverse complications and foetal loss can be reduced by giving proper antenatal care in terms of increased awareness, early antenatal care initiation and effective timely intervention, like in this scenario, use of progesterone support and its usage was observed to be a boon.

In this study, FGR, threatened abortion and PROM are the antenatal high-risk factors in the current pregnancy that are most strongly associated with history of previous one spontaneous abortion. So careful surveillance should be provided to such women and it should not be restricted only to females with history of recurrent pregnancy losses.

LSCS (Caesarean section) was the most common mode of delivery in both the considered groups in our institute concluding that previous abortion did not affect the current mode of delivery.

The consequences of miscarriage are both physical, such as bleeding or infection, and psychological. Psychological consequences include anxiety, negative emotions, depression, post-traumatic stress disorder, and suicide. Fortunately, research shows that counseling and supportive care for women with a history of miscarriage can lead to positive outcomes, with live birth rates of 70-80%.

Inadequate previous medical records and the lack of proper information/history given by the patients about the reason (if known) and management (medical or surgical) regarding their previous spontaneous abortion and the lack of information on their exact gestational age at miscarriage could be a vital drawback of this study. Much larger sample sizes and a larger database is necessary for further analysis and interpretation of all the variables that is lacking in this study.

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