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Original Research Article

# A Prospective Comparative Study of Obstetric Outcome in Pregnant Women with and without History of Spontaneous Abortions

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**Abstract:**

**Background:** The term "spontaneous abortion" refers to abortion that occurs without the use of medical or mechanical means to empty the uterus. Previous instances of spontaneous abortions should be considered high-risk pregnancy because they may result in negative outcomes in the future Pregnancies with low birth weight, preterm labour, intrauterine growth restriction, and subsequent pregnancy loss. The current study goal is to compare pregnancy outcomes in women who have had prior abortions to normal pregnancy outcomes. The effect of emotional support, good antenatal care supplemented with ultrasound in early pregnancy gives success rates.

**Methodology:** This was a prospective comparative study done at a tertiary care hospital-Government Maternity Hospital, Tirupati, Andhra Pradesh, India for 1year period in 200 cases.

**Conclusion:** Women who suffer an initial miscarriage are more likely to experience some obstetric and perinatal issues than women who have a successful initial pregnancy. There is association between previous spontaneous abortion and PROM, IUD in subsequent pregnancies. The likelihood of a successful result declines as the number of prior abortions rises.

**Keywords:** Abortions, Spontaneous Abortions, Intra Uterine Death.



## Introduction

The term miscarriage is used to describe a pregnancy that fails to progress, resulting in death and expulsion of the fetus or embryo. As per WHO, Centre for Disease control and Prevention, National Centre for Health Statistics Abortion is defined as pregnancy termination before 20 weeks of gestation or fetus delivered with weight less than 500 grams. Miscarriage is also defined as involuntary spontaneous loss of pregnancy before 20-24 completed weeks as period of gestation which qualifies as miscarriage varies from different countries, in India and United States, it is 20 weeks whereas in UK, it is 24 weeks.

Pregnancy plays a unique role in the transformation of women towards completeness. It is the time when her entire life seems to be changing. Pregnancy should be regarded as a normal physiological event in the life of a woman. Normally, every couple expects a positive outcome, but in a few cases, the pregnancy outcome is a disaster, bringing a slew of unavoidable emotions to the couple. Studies have been done on the effects on reproduction with difficulties. The first of these was a clinical entity's diagnostic criteria. Reports on the definition of a miscarriage varies among 117 women, whose gestational ages range from 13 to 28 weeks, making it impossible to compare the results of subsequent pregnancies.

Spontaneous Abortion: The term "spontaneous abortion" refers to abortion that occurs without the use of medical or mechanical means to empty the uterus. Early pregnancy loss is defined by the American College of Obstetricians and Gynecologists as a nonviable intrauterine pregnancy with either an empty gestational sac or a gestational sac containing an embryo or fetus and no fetal cardiac activity within the first 12 weeks.1 The most common pregnancy complication is spontaneous abortion, which accounts for 10-20% of all cases and 80% of all clinical pregnancies occur in the first trimester. Previous instances of spontaneous abortions should be considered high-risk pregnancy because they may result in negative outcomes in the future Pregnancies with low birth weight, preterm labour, intrauterine growth restriction, and subsequent pregnancy loss. The

current study goal is to compare pregnancy outcomes in women who have had prior abortions to normal pregnancy outcomes. The effect of emotional support, good antenatal care supplemented with ultrasound in early pregnancy gives success rates.

**Aim:** To study Obstetric outcome in pregnant women with previous spontaneous abortions

**Objectives:**

- To assess prevalence of pregnant women with previous spontaneous abortions.
- To identify demographic, etiological and associated causes of spontaneous abortion.
- To analyse association between antenatal complications and previous spontaneous abortions.
- To analyse maternal and perinatal outcome in relation to previous history of abortion and number of abortions.
- To compare the maternal and perinatal outcome in pregnant women with and without history of spontaneous abortions.

**Materials & Methods:** This was a prospective comparative study done at a tertiary care hospital-Government Maternity Hospital, Tirupati, Andhra Pradesh, India for 1year period in 200 cases.

Patients who attended antenatal OPD for check-up and follow-up and were admitted in the labor room for delivery were enrolled for the study. Details of study protocol explained to subjects and Informed consent is obtained. Name, age, marital status, parity, address, socioeconomic status, literacy were taken. Detailed obstetric, menstrual, family history and medical history of each patient were taken. Detailed history regarding previous abortion like spontaneous or induced, H/o trauma or coitus or long distance travel, Period of gestation at the time of abortion, Whether verified or not. If verified place of management Mode of termination (medical or surgical). After admission in the labor room, General physical examination, Vital data, Systemic examination recorded. Per abdominal examination Routine blood investigations- blood grouping typing, HIV, Hbs Ag, haemoglobin levels, random blood sugar levels, urine routine and microscopy were done. Once the patient entered into the active labor, her mode of delivery outcome of delivery was observed. Data of these patients were collected in a prospective manner and analyzed. Statistical analysis was done using statistical software named statistical package for the social science version 20.0.0 (SPSS Inc., Chicago, Illinois, USA). All categorical variables were expressed in percentage

**Results:**

**Table 1: Age Wise Distribution of Study Population (N=200)**

| Age in Years | With Abortion (Case) | | Without Abortion (Control) | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| **18–24** | 6 | 6% | 45 | 45% | 51 | 25.5% |
| **25–30** | 48 | 48% | 29 | 29% | 77 | 38.5% |
| **31–35** | 46 | 46% | 26 | 26% | 72 | 36% |
| **Total** | 100 | 100% | 100 | 100% | 200 | 100% |
| **Mean±SD** | 29.66±3.42 | | 25.79±5.40 | | 27.72±4.91 | |
| **Chisquare test=40.06,p=<0.0001*,Statistically significant** | | | | | | |

**Table 2: Gravida Wise Distribution of Study Population (N=200)**

| Gravida Status | Case(n=100) | | Control(n=100) | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| **2** | 52 | 39% | 74 | 74% | 126 | 63% |
| **3** | 19 | 19% | 18 | 20% | 37 | 18.5% |
| **4** | 25 | 25% | 6 | 6% | 31 | 15.5% |
| **5** | 2 | 2% | 2 | 0% | 4 | 2% |
| **6** | 2 | 2% | 0 | 0% | 2 | 1% |
| **Total** | 100 | 100% | 100 | 100% | 200 | 100% |
| **Chisquare test=17.51,p=<0.0001*,Statistically significant** | | | | | | |

**Table 3: Distribution of Cases Based on Previous History of Abortion (N=100)**

| Number of previous Abortions | Frequency | Percentage |
|---|---|---|
| **1** | 44 | 44% |
| **2** | 22 | 22% |
| **3** | 18 | 18% |
| **4** | 16 | 16% |
| **Total** | 100 | 100% |

**Table 4: Distribution Of Cases Based On Causes Or Risk Factors Associated With Spontaneous Abortions.**

| Probable Cause/Risk Factors | Cases (n=100) | Percentage (%) |
|---|---|---|
| Abnormal Embryonic Development | 9 | 9% |
| Chromosomal anamolies | 0 | 0% |
| Maternal Infections | 7 | 7% |
| Diabetes Mellitus, Hypothyroidism | 19 | 19% |
| Trauma | 1 | 1% |
| Lifestyle (Drugs/Alcohol, cigarettes, obesity) | 0 | 0% |
| Congenital Uterine Anamolies | 4 | 4% |
| Cervical Incompetence | 8 | 8% |
| Uterine Leiomyomas | 2 | 2% |
| Uterine Synechiae | 0 | 0% |
| Paternal Factors | 0 | 0% |
| Autoimmune Diseases(APLA) | 1 | 1% |
| Unknown Factors | 49 | 49% |

**Table 5: Distribution of Study Population Based On Mode of Termination of Pregnancy (N=200)**

| Mode of | Case(n=100) | | Control(n=100) | | Total | |
|---|---|---|---|---|---|---|
| **Termination of Pregnancy** | N | % | N | % | N | % |
| **FTND** | 20 | 20% | 77 | 77% | 97 | 48.5% |
| **Assisted Breach** | 25 | 25% | 2 | 2% | 27 | 13.5% |
| **LSCS Emergency** | 13 | 13% | 21 | 21% | 34 | 17% |
| **Outlet Forceps** | 24 | 24% | 0 | 0% | 24 | 12% |
| **Spontaneous expulsion** | 18 | 18% | 0 | 0% | 18 | 9% |
| **Total** | 100 | 100% | 100 | 100% | 200 | 100% |
| **Chisquare test=97.97,p=<0.0001*,Statistically significant** | | | | | | |

**Table 6: Distribution of Study Population Based On Obstetric Outcome (N=200)**

| Outcome | Case(n=100) | | Control(n=100) | | Total | |
|---|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | **N** | **%** |
| Full term | 27 | 27% | 69 | 69% | 96 | 48.5% |
| Postdated | 14 | 14% | 11 | 11% | 25 | 12.5% |
| Preterm | 16 | 16% | 9 | 9% | 25 | 7.5% |
| PROM | 9 | 9% | 6 | 6% | 15 | 6.5% |
| IUGR | 7 | 7% | 3 | 3% | 11 | 5.5% |
| IUD | 12 | 12% | 1 | 1% | 15 | 6.5% |
| Still birth | 1 | 1% | 0 | 0% | 1 | 0.5% |
| Abortion | 14 | 14% | 2 | 2% | 16 | 8% |
| Total | 100 | 100% | 100 | 100% | 200 | 100% |
| **Fischer Exact test value=77.90,p=<0.0001*,Statistically significant** | | | | | | |

**Table 7: Distribution of Study Population Based On Indication for LSCS/Forceps Delivery**

| Indication | With abortion (Case) | | Without Abortion (Control) | | Total | |
|---|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | **N** | **%** |
| Breech Presentation | 6 | 16.2% | 2 | 9.5% | 8 | 13.8% |
| CPD | 4 | 10.8% | 6 | 28.6% | 10 | 17.2% |
| Fetal distress | 4 | 10.8% | 5 | 23.8% | 9 | 15.5% |
| IUG(R | 5 | 13.5% | 5 | 23.8% | 10 | 17.2% |
| Oligohydromnios | 7 | 18.9% | 3 | 14.3% | 10 | 17.2% |
| Transverselie | 6 | 16.2% | 0 | 0.0% | 6 | 10.3% |
| Non-progression | 5 | 13.5% | 0 | 0.0% | 5 | 8.6% |
| Total | 37 | | 21 | | 58 | 100% |
| **Fischer Exact test value=15.35,p<0.001*, Statistically significant** | | | | | | |

**Table 8: Comparison of Obstetric Outcome among Cases (N=100)**

| Outcome | G2A1 | G3A2 | G4A3 | G5A4 | Total |
|---|---|---|---|---|---|
| Full term | 16 | 5 | 2 | 4 | 27 |
| Post dated | 8 | 3 | 1 | 2 | 14 |
| Pre term | 11 | 4 | 5 | 1 | 21 |
| PROM | 4 | 6 | 1 | 2 | 13 |
| IUGR | 2 | 0 | 4 | 2 | 8 |
| IUD | 2 | 1 | 3 | 1 | 7 |
| Still birth | 0 | 1 | 0 | 1 | 2 |
| Abortion | 1 | 2 | 2 | 4 | 9 |
| Total | 44 | 22 | 18 | 16 | 100 |
| **Fischer Exact test value =17.43,p=0.68, Not Statistically significant** | | | | | |

**Table 9: Correlation of Obstetric Indices and Outcome among Controls**

| Outcome | G2P1L1 | G3P2L2 | G4P3L3 | G5P4L4 | Total |
|---|---|---|---|---|---|
| Full-term | 48 | 16 | 5 | 2 | 69 |
| Postdated | 7 | 2 | 1 | 0 | 9 |
| Preterm | 10 | 0 | 0 | 0 | 10 |
| Antenatal complications (PROM & placental complications) | 4 | 0 | 0 | 0 | 4 |
| Intrauterine Growth Retardation | 5 | 0 | 0 | 0 | 5 |
| Abortion | 0 | 0 | 0 | 0 | 0 |
| Total | 74 | 18 | 6 | 2 | 100 |
| **Fischer Exact Test value =8 .75, p=0.72, Not statistically significant** | | | | | |

**Table 10: Comparison Of Pregnancy Outcomes Between Patients Having One Previous Abortion (G2a1-Cases Group) And One Previous Live Birth (G2p1la-Control Group)**

| Outcome | G2A1(Case) N=44 | | G2P1L1(Control) N=74 | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Full term | 16 | 16.9% | 48 | 64.9% | 55 | 46.6% |
| Post dated | 8 | 18.2% | 7 | 9.5% | 15 | 12.7% |
| Preterm | 11 | 25% | 10 | 13.5% | 19 | 16.1% |
| PROM | 4 | 9% | 4 | 5.4% | 6 | 5.1% |
| IUGR | 2 | 4.5% | 5 | 6.8% | 7 | 5.9% |
| IUD | 2 | 4.5% | 0 | 0.0% | 6 | 5.1% |
| Still birth | 0 | 0.0% | 0 | 0.0% | 4 | 3.4% |
| Abortion | 1 | 2.7% | 0 | 0.0% | 6 | 5.1% |
| **Total** | **44** | **100.0%** | **74** | **100.0%** | **118** | **100.0%** |

**Table 11: Comparison Of Pregnancy Outcomes Between Patients Having Two Previous Abortions (G3a2-Cases Group) And Two Previous Live Births (G3p2l2)**

| Outcome | G3A2 | | G3P2L2L2 | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Full term | 5 | 22.7% | 16 | 88.9% | 19 | 47.5% |
| Postdated | 3 | 13.6% | 2 | 11.1% | 5 | 12.5% |
| Preterm | 4 | 18.16% | 0 | 0.0% | 3 | 7.5% |
| PROM | 6 | 27.2% | 0 | 0.0% | 4 | 10.0% |
| IUGR | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| IUD | 1 | 4.5% | 0 | 0.0% | 5 | 12.5% |
| Still birth | 1 | 4.5% | 0 | 0.0% | 2 | 5.0% |
| Abortion | 2 | 9.09% | 0 | 0.0% | 2 | 5.0% |
| Total | 22 | 100.0% | 18 | 100.0% | 40 | 100.0% |

**Table 12: Comparison Of Pregnancy Outcomes Between Patients Having Previous Three Abortions (G4a3-Case Group) And Having Previous Three Live Births (G4p3l3-Control Group).**

| Outcome | G4A3 | | G4P3L3 | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Full-term | 2 | 11.1% | 5 | 83.3% | 7 | 29.2% |
| Postdated | 1 | 5.6% | 1 | 16.7% | 2 | 8.3% |
| Preterm | 5 | 27.7% | 0 | 0.0% | 4 | 16.7% |
| PROM | 1 | 5.6% | 0 | 0.0% | 1 | 4.2% |
| IUGR | 4 | 22.2% | 0 | 0.0% | 3 | 12.5% |
| IUD | 3 | 16.7% | 0 | 0.0% | 3 | 12.5% |
| Stillbirth | 0 | 0.0% | 0 | 0.0% | 2 | 8.3% |
| Abortion | 2 | 11.1% | 0 | 0.0% | 2 | 8.3% |
| Total | 18 | 100.0% | 6 | 100.0% | 24 | 100.0% |

**Table 13: Comparison Of Pregnancy Outcome Between Patients Having Previous Four Abortions (G5a4-Cases Group) And Previous Four Live Births (G5p4l4-Control Group)**

| Outcome | G5A4 | | G5P4L4 | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Full term | 4 | 25.0% | 2 | 100% | 6 | 33.3% |
| Postdated | 2 | 6.3% | 0 | 0% | 1 | 5.6% |
| Preterm | 1 | 6.3% | 0 | 0% | 1 | 5.6% |
| PROM | 2 | 12.5% | 0 | 0% | 2 | 11.1% |
| IUGR | 2 | 6.3% | 0 | 0% | 1 | 5.6% |
| IUD | 1 | 6.3% | 0 | 0% | 1 | 5.6% |
| Stillbirth | 1 | 6.3% | 0 | 0% | 2 | 11.1% |
| Abortion | 4 | 25.0% | 0 | 0% | 4 | 22.2% |
| Total | 16 | 100.0% | 2 | 100% | 18 | 100.0% |

**Table 14: Comparison between Birth Weight and Number of Previous Live Births among the Control Group**

| Obstetric Index | Normal(2.5kg- 3.5kg) | | LBW(<2.5kg) | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | Mean±SD |
| G2P1L1 | 58 | 69.0% | 8 | 50.0% | 2.94±0.55 |
| G3P2L2 | 18 | 21.4% | 7 | 43.8% | 3.19± 0.40 |
| G4P3L3 | 6 | 7.1% | 1 | 6.3% | 3.08±0.48 |
| G5P5L4 | 2 | 2.4% | 0 | 0.0% | 3.10±0.42 |
| Total | 84 | 100.0% | 16 | 100.0% | 2.99±0.52 |

**Table 15: Comparison between Birth Weight and Number of Previous Abortions among Cases Group**

| Obstetric Index | Normal (2.5kg-3.5kg) | | LBW(<2.5kg) | | Total |
|---|---|---|---|---|---|
| | N | % | N | % | Mean±SD |
| **G2A1** | 15 | 60.01% | 11 | 30.5% | 2.46±0.79 |
| **G3A2** | 9 | 36.1% | 6 | 16.6% | 3.01±0.88 |
| **G4A3** | 4 | 16.7% | 9 | 25.0% | 1.73± 0.82 |
| **G5A4** | 2 | 16.4% | 10 | 27.7% | 0.98±0.35 |
| **Total** | 25 | 100% | 36 | 100.0% | 2.23±0.77 |

**Table 16: Comparison of Maternal Outcome among Cases and Controls**

| Maternal Outcome | With abortion (Case) | | Without Abortion (control) | |
|---|---|---|---|---|
| | N | % | N | % |
| FTND | 15 | 25.9% | 43 | 81.1% |
| Assisted Breach | 13 | 22.5% | 1 | 1.9% |
| LSCS Emergency | 6 | 10.3% | 9 | 17.0% |
| Outlet Forceps | 12 | 21.1% | 0 | 0.0% |
| Spontaneous expulsion | 8 | 13.8% | 0 | 0.0% |
| Antepartum Hemorrhage | 4 | 6.04% | 0 | 0.0% |
| Septic shock | 1 | 1.72% | 53 | 100.0% |
| Death | 0 | 0.0% | 0 | 0.0% |
| Total | 58 | 100.0% | 53 | 100.0% |

**Table 17: Comparison of Infants with NICU Admission among Cases and Controls**

| Study population | Total no. of patients | No. of children with NICU admission | % | Chi- Square value | P-Value |
|---|---|---|---|---|---|
| Cases | 100 | 22 | 22% | | |
| Controls | 100 | 7 | 7% | 14.7 | <0.001 |

## Discussion

Pregnancy plays a unique role in the transformation of woman towards completeness. Pregnancy should indeed be considered a normal physiological event in a woman's life. However, in some cases many twists and turns occur which alter the good outcome of pregnancy into a disaster. The word abortion derives from the Latin word aboriri means to miscarry. Abortion is described as the spontaneous or induced termination of pregnancy before fetal viability.

**Prevalence:** In this study, prevalence of spontaneous abortions was 11.09% of total deliveries. In the study done by J.E.Chevano et al [1]. In United States concluded that prevalence of spontaneous abortion was 12-24%. In a study done by Dann Zheng et al [2]. Significantly higher prevalence was indicated in general women with low socio economic status. In a study done by Mehdi Moradinazar et al [3]. With 5000 deliveries in a year, 300 patients had at least one spontaneous abortion thus prevalence was 6% and this was in consonance with present study findings. Shameel Faisal et al. [4], in his study found prevalence of spontaneous abortion was 18% mainly 5.6% seen in hypothyroidism patients.

**Socio demographic characteristics:** In the present study, mean age of the participants was 27.72±4.91 years, average age of the participants who had abortion was 29.66±3.42 years and the cases who did not have abortion mean age was 25.79±5.40, and in this study it was observed that there was a statistically significant difference in the mean age across the cases who had abortion and the controls who have abortion. According to the above data, chances of abortion increases in age group of >30 yrs.

In group A (control group) majority of patient underwent normal delivery with history of previous normal delivery in age group of 20-30 yrs., while group B (case group) revealed that there are more chances of abortion as age increases. 3 cases were reported of prior abortion in age group above 30 yrs. The majority of patients in the study conducted by Faswila M et al., [5] belong to the age category of 21-29 years, and this conclusion was consistent with the results of the current investigation. The maternal age was found to have a more significant association with abortion in the study conducted by Neha N et al. [6], and this was consistent with the results of the current investigation.

Additionally, they are more likely to have premature deliveries, malpresentations, and low birth weights. However, many of these dangers aren't any greater than they were in primigravida. Therefore, women who experience an initial early pregnancy loss behave like "virtual primigravida" during their subsequent pregnancies, not only in terms of their labour and delivery characteristics but also in terms of pregnancy problems and newborn outcomes. There is controversy in literature regarding the exact correlation of birth weight. In the study done by Bhattacharya et al the adjusted risk was of 1.6 times. Also, in the study by black et al too, rate of low birth weight was quite high with an adjusted OR of 2.8 and p value <0.001. Similar results were concluded in other studies by Goldhaber MK et al., [7] too.

**Status of present pregnancy:** In the current study, 74% of control group and 39% of case group belongs to second gravida. It was found that there was a statistically significant disparity in the gravida status between those that underwent abortions and those that did not. It was noted that the chances of having abortion were more with cases who had higher gravida .Similar findings were seen in study done by Priya somu et al. (SOMU, 2008), at Government madras medical college.

**History of previous abortions:** In the present study, 44% of the cases had A1, 22% of the cases had A2, 18% of the cases had A3, 16% of the cases had A4.

According to Rush RW et al., [8] patients having a history of two or more spontaneous pregnancies that ended before 37 weeks of gestation were more likely to experience spontaneous labour and delivery in subsequent pregnancies. This risk was associated with prior spontaneous preterm births and second trimester abortions but not with prior first trimester abortions. A patient's chance of giving birth prematurely again ranged from 38 to 43% if one or more of their pregnancies ended spontaneously in the second trimester or with preterm labour and delivery. There was no statistically significant distinction between the two groups in terms of the effects of miscarriage on subsequent pregnancies' obstetric and perinatal outcomes. As postulated by Black M, Shetty A, we agree that it might be due to a balance being struck by increased incidence at each end of the reproductive age spectrum.

**Risk factors associated with spontaneous abortions:**

Present study concluded that cause of spontaneous abortion remained unidentified in 49% of cases. In the study conducted by Maria Tania Silva Olivria et al. [9], based on systemic review with associated factors of spontaneous abortion found that, increase in bodyweight characterized by obesity or over weight may cause abortion due to ineffective insulin action which leads to metabolic disorders that affects fetal development leading to abortion. That study also concluded that smoking is associated with spontaneous abortion with increase in 11.5% of women aged 20-29 years and 5.8% in women aged 30-39 years. That study also stated there is strong association between maternal infections like bacterial vaginosis, Rubella, Toxoplasmosis and spontaneous abortions. Chromosomal abnormalities represent a main cause found in 9.3% of cases with mosaicis and 68% with autosomal trisomy. The study concluded that etiology of spontaneous abortion was heterogenous and 50% have no identifiable causes.

**History of abortion and mode of delivery:**

It was found that instances with a history of abortion were more likely to experience aided labour, whereas cases without a history of abortion were more likely to deliver via FTND.

In the study conducted by Faswila M et al.,[5] it was revealed that 4.3% of patients had anaemia that was very severe, 10% had anaemia that was severe, and 30% had anaemia that was moderate. The majority of patients (45.7%) had a history of one prior abortion, followed by two prior abortions (38.6%). Given the patterns of maternal complications and early neonatal mortality observed in their study, and previously reported clinically undiagnosed vasculopathy, infection, and inflammation or the presence of these 3 factors, they speculated that these conditions may be mediated, perhaps, through a common or shared etiology, including vasculopathy, uteroplacental under perfusion, chronic hypoxia, and placental ischemia. In terms of symptomatology, individuals with prior abortions had a considerably greater frequency of PV leak (14 out of 50) than those who had previously given birth to a live child (4 out of 50). This is consistent with the findings of Lykke Melve KK et al. [10], who in a 2009 study showed a comparable rise in PV leak incidence and associated spontaneous expulsion.

**Mode of delivery:** In the present study, there was a statistically significant difference in the mode of delivery among the cases that had abortion and the cases who have live births. In this study it was observed that the cases that had abortion had more spontaneous expulsions when compared to controls who have live birth. It was observed that FTND was more among controls.

Our findings indicate that there may be specific obstetric issues that are more likely to occur in women who have experienced their first miscarriage compared to those who have had previous successful pregnancies. Pre-eclampsia, impending miscarriage, generalised antepartum haemorrhage, induced labour, and assisted delivery are a few of these. Additionally, they are more likely to experience preterm labour, malpresentation, and low birth weight. Similar findings were reported by Bhattacharya et al., [11] who came to the conclusion that women who have experienced their first miscarriage may be more susceptible to some obstetric issues than those who have had previous successful pregnancies. Pre-eclampsia, threatening miscarriage, generalised antepartum haemorrhage, induced labour, caesarean section, and manual placenta removal are a few of these.

**Obstetric outcome:** In the present study, it was observed that there was a statistically significant difference in the mode of delivery among the cases that had abortion and the controls that have live births. In this study it was found that the cases that had abortion had more spontaneous expulsions when compared to control who have live birth. It was observed that FTND was more among controls.

In the research published by Keirse MJ et al., [12] they found that patients had a higher chance of spontaneous pre-term labour and delivery in subsequent pregnancies if they had a history of two or more pregnancies that ended spontaneously before 37 weeks gestation. This higher risk was primarily connected to past abortions that occurred in the second trimester rather than the first. Patients who had previously experienced one spontaneous preterm labour and birth had a 37% risk of doing so again, and those who had previously experienced two or more preterm deliveries had a 70% risk. A similar finding has been made in the current study as well.

In the research done by Gangatkar PR et al., they have observed that Comparing the pregnancy outcomes of the case and control groups case group had a higher number adverse pregnancy or neonatal outcome, compared to the control group (p value = 0.05), adverse outcome were higher in case population, adverse outcomes which were independently related with initial spontaneous abortion were oligohydramnios (p=0.02), GDM (p=0.05), LSCS (p=0.01), low birth weight (p=0.03), low Apgar scores 1st minute (p = 0.009), low Apgar score at 5thminute (p = 0.03) and babies requiring NICU care (p = 0.001).

According to a study by Kashanian M. et al. [13], there is a higher chance of repeat abortion (16.5%), fetal death (1.5%), and caesarean section rates (28.1%) in cases of prior miscarriage. [5] Approximately 37% of patients in the current study had caesarean sections, compared to 21% of controls. Preterm birth rates (13%), perinatal death (2.5%), and caesarean section (36%), according to a survey by Jivraj et al., [14] conducted in September 2000, were all remarkably high

According to Faswila M. et al study, [5] the ultimate outcomes were term live birth 47 (74.3%), abortion 9(14.3%), preterm delivery 5(8.6%), still birth 2 (2.8%), and caesarean section (23.3%) for a variety of reasons. Pre- eclampsia accounted for 4.76%, malpresentation for 7.93%, total 3 cases of antepartum haemorrhage, of which placenta previa accounts for approximately 3.1% and abruption for 1.58%, manual placenta removal for 4.7%, and low birth weight for 7.6%. Additionally, 19.23% of pregnant women had term PROM, 9.09% had PPROM, 5.76% had term IUGR, 3.84% had term IUD They came to the conclusion that a previous history of spontaneous abortion is linked to a poor pregnancy outcome.

**Indication for LSCS:** In the current study there was a statistically significant association between indication for LSCS/Forceps delivery and history of abortion. Breech presentation, oligohydramnios, transverse lie, non-progression of labor were significantly more among cases with history of labour and CPD, Fetal distress, IUGR was more common indications among cases without history of abortion.

In accordance with a study by Kashanian M. et al. [12], there is a higher chance of repeat abortion (16.5%), foetal death (1.5%), and caesarean section rates (28.1%) in cases of previous miscarriage. [5] Approximately 37% of patients in the current study had caesarean sections, compared to 21% of controls.

According to Tanwar K. et al study [15], women who have had prior induced surgical abortions are more likely to have preterm births, extremely preterm births, low birth weight babies, and subsequent pregnancies that require stays in the neonatal intensive care unit (NICU). Previous induced abortions were found to increase the probability of caesarean delivery, exposing the women to the morbidity connected with the procedure. Therefore, in a second pregnancy, the patient who has already undergone a surgical first trimester abortion requires closer care during the prenatal period.

**Obstetric indices and outcomes of pregnancy:** In the current investigation, it was shown that neither the cases nor the controls' obstetric indicators nor outcomes showed any statistically significant correlation.

**Pregnancy outcomes in comparison to cases and controls:** When compared to cases with the same number of live births, it was found in the current study that cases with more abortions had worse pregnancy outcomes.

Among the patients presenting with previous abortions, 12 out of 50 (around 18%) had 2 successive abortions. These patients are expected to have higher incidence of complications in the present pregnancy too and in turn result in LSCS being the method of choice for delivery. As a result, it appears that our results are consistent with the literature. The variation in incidence and deviation of outcomes in a couple of studies could be related to the varying geographical regions these studies have been conducted and more importantly to the varying socio-economic group of populations concerned.

In a related study, Moreau C et al., [16] found that women with a history of spontaneous abortion were more likely to deliver babies who were very preterm than women without such a history (OR + 1.5, 95% CI 1.1-2.0); the risk was even higher for babies who were delivered who were extremely preterm ( 28 weeks). Depending on the primary difficulties leading to very preterm delivery, there were different correlations between prior spontaneous abortion and very preterm delivery. An increased risk of early membrane rupture, antepartum haemorrhage (not in connection with hypertension), and idiopathic spontaneous preterm labour that occurs at very early gestational ages (28weeks) was linked to a history of spontaneous abortion. On the other hand, there was no correlation between induced abortion and very premature birth owing to hypertension.

**Birth weight and APGAR:** It was observed in present study that the rate of low birth weight is more in case group of 36% compared to 16% in control group. From this study low birth weight incidence increases with increase in previous spontaneous abortion. Similar finding were found in literature. In the study done in Karnataka the mean birth weight in Case group was 2.77 kg to 2.91 kg in Control group which was statistically insignificant similar to observation of Weintraub A Y et al. [17] Low birth weight was observed in 22.85% of Cases compared to 10% in Control group which was statistically significant ($p < 0.04\%$). Studies by Alberman E et al, [18] had similar observations.

There is controversy in literature regarding the exact correlation of birth weight. In the study done by Bhattacharya et al the adjusted risk was of 1.6 times. Also, in the study by black et al too, incidence of low birth weight was quite high with

an adjusted OR of 2.8 and p value <0.001. Similar results were concluded in other studies by Goldhaber MK et al., [7] too developed countries and institutions catering to medium and high socio-economic groups are bound to have lesser incidence of low birth weight.

In the study by Black et al, [19] Risk of prematurity at less than 37weeks of gestation was increased (adjustedOR2.8 95%CI 1.9–4.2) in the exposed cohort, low birth weights (adjusted OR 2.8, 95% CI1.7–4.5) were also more common (adjusted OR 2.895% CI 2.0–3.9) in the exposed group. There was statistically significant difference between cases and controls in terms of APGAR at 1st and 5th minute. More number of babies belonging to case group got admitted in NICU. In the study done by Muzaffar U et al., [17] they stated that pregnancy outcome following spontaneous abortion increases risk of congenital abnormalities, low APGAR at 1 minute, stillbirths and preterm delivery. The results of our study are consistent with those of Goldhaber MK et al.[7], who found that women whose first pregnancy ended in spontaneous abortion are more likely to experience preeclampsia, small for gestational age, intrauterine growth retardation, abruption, foetal distress, chorioamnionitis, and increased neonatal complications during their subsequent pregnancies.

**Maternal Outcome:** In the present study, it was observed that antepartum hemorrhage was seen in 6.04% of cases and septic shock in 1.72% of cases compared to none in controls. It was concluded that maternal complications were more in cases with history of prior spontaneous abortions. Similar findings were seen in previous studies also as explained below. Pre-eclampsia (4.4%), threatening abortion (27.1%), rate of caesarean section (4.2%), preterm delivery (9.2%), low birth weight (8.5%), and antepartum haemorrhage (5.6%) were all shown to be more common in the miscarriage group in a prior study by Bhattacharya et al [11]. According to the study's findings, there were also more high-risk indicators present. In the research conducted by Nehal N et al., [6] some of the significant confounding factors may alter the findings especially since childbirth is a dynamic process influenced by a large number of environmental, social and topographical factors. The correlation with difference in results with variation in inter-pregnancy intervals has not been established and may result in alteration of a number of factors like change in immunological mechanisms, also correction in other factors like an early registration and better.

The researchers who conducted the study, Muzaffar U et al., [17] came to the conclusion that patients who had previously experienced spontaneous abortion were more likely to have an unfavourable pregnancy outcome. Giving good antenatal care can boost the pregnancy's results in terms of difficulties for the mother and the foetus.

Kashnaian et al., [13] determined pregnancy outcomes such as placenta praevia, placenta abruptio, PROM, preeclampsia and eclampsia, abortion, breech presentation, preterm labour, intra uterine foetal death, and neonatal complications (low birth weight, visible congenital malformations, low Apgar Score minute 1) and delivery route such as caesarean section or instrumental delivery (forceps. Statistical analysis revealed that pregnancy problems after one prior spontaneous abortion were not different from those in the control group, with the exception of abortion and intrauterine foetal mortality, which were higher in the control group. In addition, the rate of caesarean section and curettage had risen. In compared to the control group, there was no statistically significant difference in neonatal problems. In summary, one past spontaneous abortion poses little danger for the following pregnancy, but the chance of abortion and IUD placement increases. As a result, special antenatal care is required.

## Conclusion

Women who suffer an initial miscarriage are more likely to experience some obstetric and perinatal issues than women who have a successful initial pregnancy. There is association between previous spontaneous abortion and PROM, IUD in subsequent pregnancies. The likelihood of a successful result declines as the number of prior abortions rises. There is association between lifestyle factors like smoking, caffeine consumption and obesity with incidence of spontaneous abortions. Women who have had their first miscarriage are more susceptible to pre- eclampsia, PROM, oligohydramnios, caesarean section rates, premature delivery, subsequent miscarriages, low birth weight, surgical interference, and IUD hazards. Therefore, continuous monitoring throughout the prenatal period is necessary for patients who have recurrent miscarriage since they constitute a group at high risk of obstetric complications.

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