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ORIGINAL RESEARCH

A Study on Obstetric Outcome after Previous Spontaneous Abortions

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Abstract

Background: In this study, we wanted to evaluate the incidence of adverse outcomes in pregnancy preceded by spontaneous abortion compared to those preceded by full term live births.

Materials and methods: This was a hospital based prospective observational study conducted among 200 pregnant women with history of previous spontaneous abortions attending the antenatal OPD and labour room in the Department of Obstetrics and Gynaecology, J.L.N Hospital and Research Centre, Bhilai, Chhattisgarh, over a period of 11 months from 1st December 2019 to 30th October 2020 after obtaining clearance from Institutional Ethics Committee and written informed consent from the study participants.

Results: The incidence of oligohydramnios in case and control groups was 13 and 4% respectively. This has a p value of 0.022 which was statistically significant. The incidence of premature rupture of membrane (PROM) in case and control groups was 22 and 11 % respectively. This has a p value of 0.03 which was statistically significant. The incidence of PPROM in case and control groups was 7 and 1 % respectively. This has a p value of 0.03 which was statistically significant. 65.59 % patients underwent lower segment caesarean section (LSCS) among cases and 50 % patients underwent LSCS among controls. This has a p value of 0.037 which was statistically significant. 5.41 % of cases had emergency caesarean section while 57.14 % of controls had emergency caesarean section which was statistically significant (p value 0.042). 42.86 % of controls had elective caesarean section owing to large number of patients in control group with history of previous caesarean scar.

Conclusion: Previous unfavourable pregnancy outcome increases the risk of adverse outcome in the future pregnancies. Majority of abortions in present pregnancy among both cases and controls are of first trimester abortions. There was significant association found between previous spontaneous abortion and oligohydramnios (13%), preterm delivery (16%), PROM (22%), PPROM (7 %), low birth weight (18.28 %), in the subsequent pregnancies. As the number of abortions increases, the incidence of term pregnancies decreases (A1-80.72%, A2-63.64 %, A3 – 60%, A4 – 0%). As the number of abortion increases, the incidence of oligohydramnios increases. The percentage of operative deliveries increases in the cases who had previous abortions. There was significant number of neonatal intensive care unit (NICU) admissions among cases. Previous abortions have a definite impact on the successful

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outcome of future pregnancies hence history of abortions in previous pregnancy should be investigated and treated.

Keywords: Obstetric Outcome, Previous Spontaneous Abortion

Introduction

Pregnancy plays a unique role in the transformation of women towards completeness. Pregnancy should be considered a unique normal physiological episode in a woman's life. When the dream of motherhood is broken by sudden unexpected spontaneous abortion, it causes great emotional trauma to both couple and family and is associated with anxiety for future pregnancy outcomes.The word abortion is derived from the Latin word aboriri–to miscarry.[1]Abortion is defined as the spontaneous or induced termination of pregnancy before foetal viability.[1] The National Center for Health Statistics, the Centers for Disease Control and Prevention (CDC), and the World Health Organization (WHO) all defines abortion as any pregnancy termination-spontaneous or induced-prior to 20 weeks gestation or with a foetus born weighing < 500 g.[1] About 8% to 20% of known pregnancies terminate in spontaneous abortion.[2,3]More than 80 percent of spontaneous abortions occur during the first 12 weeks of gestation;the incidence decreases with each gestational week.[4,5,6]In India, occurrence of spontaneous abortion in urban areas is high compared to rural areas.[7]In women who had one prior spontaneous abortion, the rate of spontaneous abortion in a subsequent pregnancy ranges from 13% to 20%; in women who had three consecutive losses, the rate is 33%[8]Patients should be reassured that, in most cases, spontaneous abortion does not recur. In women less than 36 years of age, when foetal cardiac activity is confirmed by ultrasound, the risk of spontaneous abortion is less than 4.5%. For women older than 36, the risk of spontaneous abortion rises to 10%, and above 40 years may approach 30%.[9] Risk factors for spontaneous abortion include increasing maternal age, closely spaced pregnancies (less than 3 to 6 months apart), history of previous spontaneous abortion, maternal diabetes, and maternal smoking during pregnancy.[10-14] The main causes for recurrent abortions include anatomical disorders, hormonal abnormalities, genetic anomalies and thrombophilia.[15] Previous abortion in a women increases risk of threatened abortion, preterm delivery, and foetal loss.[16]These factors have to be considered when deciding for antenatal close observations and management of pregnancy in patients with history of previous spontaneous abortions.[16]Studies have reported a favourable outcome with 70 - 80 % live birth with counselling and supportive care in patients with previous abortions[17]\ One of the suggested mechanisms for threatened abortion is placental dysfunction, which can also cause several late complications, such as preeclampsia, preterm labor, preterm birth, placental abruption, placenta previa, intrauterine growth restriction (IUGR), and perinatal mortality.[18]

Aims and Objectives

1. To compare the maternal outcomes like recurrence of abortion, preterm delivery, placenta previa, premature rupture of membranes, intranatal and postnatal complications e.g., post partum haemorrhage (PPH) in pregnant females with history of previous spontaneous abortions vs pregnant woman with previous full term deliveries and no abortion.
2. To compare the foetal outcomes like prematurity, low birth weights, NICU admission, mortality and morbidity in pregnant females with history of previous spontaneous abortions vs pregnant woman with previous full term deliveries and no abortion.

Materials and methods

This was a hospital based prospective observational study conducted among 200 pregnant women with history of previous spontaneous abortions attending the antenatal OPD and labour room in the Department of Obstetrics and Gynaecology, J.L.N Hospital and Research

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Centre, Bhilai, Chhattisgarh, over a period of 11 months from 1st December 2019 to 30th October 2020. The study was conducted after obtaining clearance from Institutional Ethics Committee and written informed consent from the study participants.

Inclusion Criteria

- Pregnant females with history of previous 1 or more than 1 spontaneous abortion.
- Age group 18–35 years.

Exclusion Criteria

- Primigravida mother.
- Pregnant women with history of induced abortion.
- HIV, HBsAg and VDRL positive mothers, History of carcinoma.
- Fibroid uterus with pregnancy.
- Diagnosed Mullerian anomalies like bicornuate uterus, septate uterus etc.
- Multiple pregnancy.
- Pregnant females unwilling for participation.
- History of preeclampsia, chronic hypertension, diabetes, heart disease, anaemia.

Statistical Methods

A master chart was prepared and the total data was subdivided and distributed meaningfully and presented as individual tables. The data obtained was subjected to statistical analysis after systematic compilation.

Statistical procedure was carried out in 2 steps

1. Data compilation and presentation
2. Statistical analysis

The data was entered in MS Excel sheet and statistical analysis was done using Statistical Package of Social Science (SPSS 16.0). Data comparison was done by applying specific statistical tests to find out the statistical significance of the comparisons. Quantitative variables were compared using mean values and qualitative variables using proportions.

Significance level was fixed at $P \leq 0.05$.

Statistical Tests

Chi square test: This is a non-parametric test when data are expressed in frequency or proportion or percentages. It is used for discrete data. Uses are:

- To evaluate statistical significance of differences in frequencies between subgroups.
- It checks the difference between observed and expected values.

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

The formula used is:

Where O= observed value, E= expected value

Student's t-test: It is used to analyse the variation in mean between 2 groups of a variable with a normal distribution.

It is of 2 types

1. Unpaired 't' test
2. Paired 't' test

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Results

Out of 100 cases, 83 % (majority) patients had 1 abortion, 11 % cases had 2 abortions, 5 % cases had 3 abortions, and 1% patient had 4 abortions.

Out of 100 cases, 77 % had term live births, 16 % had preterm live births, 6 % had abortion, 1 patient had IUFD in second trimester. Out of 100 controls, 91 % had term live births, 7 % had preterm live births, 2 percent had abortion and no IUFD. This shows that the percentage of patients having successful term pregnancies was less with patients having prior abortion.

Previous History of Abortions	**Case N (%)**
One	83
Two	11
Three	5
Four	1
Total	100

Distribution of Cases with Respect to Number of Previous Spontaneous Abortions		
Outcome	**Case N (%)**	**Control N (%)**
Abortion	6	2
IUFD	1	0
Preterm live birth	16	7
Term live birth	77	91
Total	100	100

Comparison of Pregnancy Outcomes between 2 Groups

Table 1

Comparison of Oligohydramnios		Chi square value/P value
Case N (%)	Control N (%)	
13	4	5.21/0.022 S
Comparison of Frequency of Patients with Oligohydramnios in Both the Groups		
Comparison of FGR (Foetal Growth Restriction)		Chi square value/P value
Case N (%)	Control N (%)	
12	11	0.049/0.82NS
Comparison of Frequency of FGR in Both the Groups		
Comparison of PROM(Premature Rupture of Membranes)		**Chi square value/P value**
Case N (%)	**Control N (%)**	
22	11	4.39/0.03 S
Comparison of Frequency of PROM in Both the Groups		
Comparison of PPROM		**Chi squarevalue/P value**
Case N (%)	**Control N (%)**	
7	1	4.68/0.03 S
Comparison of Frequency of PPROM between the Two Groups		
MOD	**Case N (%)**	**Control N (%)**
NVD	31(33.33%)	49(50%)
LSCS	61(65.59%)	49(50%)
Instrumental	1(1.08%)	0(0%)
Total	93(100%)	98(100%)
Comparison of Mode of Delivery between Two Groups		

Table 2

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The incidence of oligohydramnios in case and control groups was 13 and 4 % respectively. This has a p value of 0.022 which was statistically significant.
The incidence of FGR in case and control groups was 12 and 11 % respectively. This has a p value of 0.82 which is statistically non-significant.
The incidence of PROM in case and control groups was 22 and 11 % respectively. This has a p value of 0.03 which was statistically significant

Comparison of LSCS			**Chi square value/P value**
Case N (%)		**Control N (%)**	
61(65.59%)		49(50%)	5.44/P=0.019S
Comparison of Frequency of Patients with LSCS in Both the Groups			
LSCS	**Case N (%)**	**Control N (%)**	**Chi Square Value/P Value**
EMG	46(75.41%)	28(57.14%)	4.12/0.042 S
Elective	15(24.59%)	21(42.86%)	
Total	61(100%)	49(100%)	
Comparison of Frequency of Type of LSCS in Both Groups			
Indication of EMGLSCS	**Case N(%)**	**Control N(%)**	**Chi Square Value/P Value**
MSL	10(21.74%)	4(14.29%)	0.56/0.45 NS
NPOL	6(14.29%)	0(0%)	4.37/0.036 S
Compound	1(2.38%)	0(0%)	0.67/0.41 NS
Obstructed labour	0(0%)	1(3.57%)	1.52/0.22 NS
Foetaldistress	20(43.47%)	7(25%)	1.78/0.18 NS
Placenta previa	1(2.38%)	0(0%)	0.67/0.41 NS
Breech In labour	1(2.38%)	1(3.57%)	0.06/0.81 NS
Breech PPROM	1(2.38%)		
Previous LSCS PROM	2(4.76%)	2(7.14%)	12.34/0.002 HS
Previous LSCS PPROM	1(2.38%)	1(3.57%)	
Previous LSCS In labour	3(7.14%)	12(42.86%)	
Distribution of Indication of Emergency LSCS in Both Groups			
Indication of elective LSCS	**Case N (%)**		**Control N (%)**
Previous LSCS	8(53.33%)		20(95.24%)
Placenta previa	0(0%)		1(4.76%)
Precious pregnancy	5(33.33%)		0(0%)
Breech	1(6.67%)		0(0%)
Distribution of Indication of Elective LSCS in Both Groups			

Table 3

The incidence of PROM in case and control groups was 7 and 1 % respectively. This has a p value of 0.03 which was statistically significant.
Majority of cases were delivered by LSCS (65.59 %). Among cases, there was lesser percentage of vaginal deliveries (33.33 %) as compared to controls (50 %). Among controls, the ratio of vaginal deliveries with caesarean section was 1:1. Overall, this gives a significant p value of 0.012.
65.59 % patients underwent LSCS among cases and 50 % patients underwent LSCS among controls. This has a p value of 0.037 which was statistically significant.
75.41 % of cases had emergency caesarean section while 57.14 % of controls had emergency caesarean section which was statistically significant (p value 0.042). 42.86 % of controls had elective caesarean section owing to large number of patients in control group with history of previous caesarean scar.
Among cases, 43.47 % of patients had emergency caesarean section in view of foetal distress, followed by MSL (21.74 %), non progression of labour (14.29 %). Majority of patients

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among control group had emergency caesarean section in view of previous LSCS with labour pains

53.33 % of cases had elective LSCS in view of previous scar while 95.24 % of controls had elective LSCS for the same indication.

Adverse Outcome	**Case N (%)**	**Control N (%)**	**Chi Square Value/P Value**
Preterm	16(16%)	7(7%)	3.97/0.04 S
PROM	22(22%)	11(11%)	4.39/0.036 S
PPROM	5(5%)	2(2%)	1.33/0.25 NS
Oligohydramnios	13(13%)	4(4%)	5.21/0.022 S
IUGR	12(12%)	11(11%)	0.05/0.82
Operative delivery	61(61%)	49(49%)	5.44/0.019S
Placenta previa	1(1%)	1(1%)	0.0008/0.97NS
IUFD	1(1%)	0(0%)	1.005/0.31 NS
Abortion	6(6%)	2(2%)	2.08/0.15 NS
Comparison of Adverse Obstetric Outcomes in Both Groups			
NICU admission	Case N (%)	Control N (%)	Chi square value/P value
Yes	53(56.99%)	18(18.37%)	30.47/P
No	40(43.01%)	80(81.63%)	<0.0001 HS
Comparison of Frequency of Children with NICUAdmission			
Table 4			

16% of cases compared to 7 %controls had preterm deliveries which were statistically significant (p value 0.04). 22% of cases compared to 11 % of controls had premature rupture of membranes which was statistically significant (p value 0.036). 13% of cases compared to 4% controls had oligohydramnios which was statistically significant (p value 0.022). 61% of cases compared to 49 %controls had operative deliveries which were statistically significant (p value 0.019). 56.99 % of neonates among cases had NICU admission compared to 18.73 % among controls which was highly significant.

Indication of NICU Admission	**Case N (%)**	**Control N (%)**	**Chi Square Value/P Value**
LBW	17(18.28%)	8(8.16%)	4.29/0.038 S
Preterm/Prematurity	16(17.2%)	8(8.16%)	3.55/0.06 NS
NNJ	7(7.53%)	3(3.06%)	1.92/0.16 NS
Sepsis	2(2.15%)	3(3.06%)	0.15/0.69 NS
Jitteriness	2(2.15%)	0(0%)	2.13/0.14 NS
MSL	22(23.66%)	3(3.06%)	17.79/<0.0001 HS
Respiratory distress	11(11.83%)	3(3.06%)	5.39/0.020S
Hypocalcaemia	1(1.08%)	0(0%)	1.06/0.30 NS
Indications for NICU Admission in Both the Groups			
Comparison of PretermLive Births			Chi square value/P value
Case N (%)	Control N (%)		
16(16%)	7(7%)		3.97/0.04 S
Comparison of Frequency of Patients with PretermLive Births			
Table 5			

Majority of neonates were admitted in NICU for observation in view of MSL, followed by LBW, prematurity, respiratory distress.

The incidence of preterm live births in case and control groups was 16 % and 7 % respectively. This has a p value of 0.04 which was statistically significant.

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Discussion

Kashanian M et al.(2006)[19]in their prospective cohort study of 500 gravida patients(cases-whose previous pregnancy was spontaneously aborted, controls-whose previous pregnancy went to term and a live foetus was delivered) found the mean age among cases was 25.06 ± 12.89 years, and that of controls was 23.69 ± 13.78 years which was statistically insignificant.

In our study, oligohydramnios was present in 13% of cases when compared to 4% of control which was found to be statistically significant ($p < 0.022\%$).

Study conducted by Weintraub AY et al.[20] (2011) also had similar results where oligohydramnios was more in women with one previous abortion.

The percentage of patients who had PROM among control group was 11 percent and among cases were 22 percent. This had a p value of 0.03 which was statistically significant.

Similar study done by Ekwo EE et al. (1993)[21] showed in his study "Previous pregnancy outcome and subsequent risk to preterm rupture of amniotic sac membranes" that previous preterm delivery, abortion and prematurity all increase the risk for subsequent preterm birth with / without PROM.

7 % of cases had preterm premature rupture of membranes while only 1 % of controls had the same which was statistically significant.

A population-based Swedish study by Buchmayer SM et al.[22] in 2004 also showed higher incidence of PPROM in patients with history of previous pregnancy losses.

16 % in case group had preterm delivery when compared to 7 % in control group which was statistically significant. (p value 0.04) Ruth M P et al. (1985)[23] showed that as number of abortion increases preterm delivery increases substantially.

Brigham SA et al. (1999)[24]conducted a longitudinal study on pregnancy outcome following idiopathic recurrent abortion. Out of a total of 325 idiopathic recurrent abortion cases analyzed, 70% (n=226) conceived, with a 75% success rate. Of 55 abortions, longitudinal assessment showed that six losses occurred following the early detection of foetal cardiac activity (3%).

There were no birth defects of new born found in the study. The mean birth weight in case group was 2944 grams to 2952 grams in control group which was statistically insignificant.

The total number of babies who had low birth weight in case group (18.28 %) were higher than control group (8.16 %) which gave a statistically significant value. This observation was similar to observation of Weintraub A Y et al.(2011).[20] Low birth weight was observed in 22.85% of cases compared to 10c% in control group which was statistically significant ($p < 0.04\%$).

Around 56.99 % of children in cases group had NICU admission compared to 18.37% in control group which was statistically significant ($p < 0.0001\%$).

ReginaldPW et al. (1987)[25]reported 161 perinatal mortality out of 1000 births. It has been established that supportive care and antenatal check-ups improves the pregnancy outcome. In our study, live foetuses were delivered by 94.6% booked mothers, which is similar to the findings of Clifford et al. (1997).[26] To conclude, patients with previous history of spontaneous abortion are associated with adverse pregnancy outcome. The complications and foetal loss can be reduced by booking the patients and giving due antenatal care and treatment.

Conclusion

Previous unfavourable pregnancy outcome increases the risk of adverse outcome in the future pregnancies. Majority of abortions in present pregnancy among both cases and controls are of

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first trimester abortions. There was significant association found between previous spontaneous abortion and oligohydramnios (13%), preterm delivery (16%), PROM (22%), PPROM (7 %), low birth weight (18.28 %), in the subsequent pregnancies. As the number of abortions increases, the incidence of term pregnancies decreases (A1-80.72%, A2-63.64 %, A3 – 60%, A4 – 0%).As the number of abortion increases, the incidence of oligohydramnios increases. The percentage of operative deliveries increases in the cases who had previous abortions. There was significant number of NICU admissions among cases. Previous abortions have a definite impact on the successful outcome of future pregnancies hence history of abortions in previous pregnancy should be investigated and treated.

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