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Original Research Article

The comparison of USG measured cervical length in pregnant women with previous induced abortion versus those who have not had an induced abortion

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ABSTRACT

Background: The majority of women who undergo induced abortion are young and of low parity. Hence, it is desirable to look for any association effects of induced abortion with future reproductive outcomes. In this study, we aim to compare ultrasound measured cervical length in pregnant women with previous induced abortion versus those who have not had an induced abortion.

Methods: This was a prospective observational study performed at tertiary care hospital. Total of 400 patients were recruited, divided into two groups. Patients with an induced abortion in previous pregnancy were included as cases and those with no history were taken as controls. Cervical length was measured by transvaginal ultrasound in all participants at 11-14, 18-22 and 28-32 weeks. Pregnancies were followed up to note incidence of spontaneous preterm delivery, preterm pre labour rupture of membranes (PPROM), threatened preterm, and second trimester miscarriage.

Results: Authors have found that there was no significant difference in the cervical length of pregnant patients with or without a history of prior induced abortions. In our study authors found that mean cervical length at 11-14weeks, 18-22 weeks, and 28-32 weeks was $3.47\pm 0.126\text{cm}$ and $3.48\pm 0.195\text{cm}$; $3.44\pm 0.296\text{cm}$ and $3.49\pm 0.182\text{cm}$; $3.36\pm 0.477\text{cm}$ and $3.42\pm 0.310\text{cm}$ respectively among cases and controls. However, there was a demonstrably increased risk of spontaneous preterm delivery, PPRM and threatened preterm in patients with a history of prior induced abortion.

Conclusions: Authors conclude that previous induced abortion increases the risk of threatened preterm, PPRM, spontaneous preterm delivery in the subsequent pregnancy. But, this risk is not predictable by measuring cervical length as the mean cervical length remained the same in both the groups.

Keywords: Cervical length, Induced abortion, Preterm labor, Preterm pre labour rupture of membranes, Short cervix,

INTRODUCTION

As per India's first national study to detect the incidence of abortions, an estimated 15.6 million abortions were reported in the year 2015. This accounts for abortion rate of 47 per 1000 women of reproductive age group.¹ The majority of women who undergo induced abortion are young and of low parity.² Hence, it would be desirable to look for any association or adverse effects of induced

abortion on future reproductive performance. The international literature on induced abortions and the outcome of subsequent pregnancies is limited and inconclusive. There is no clear consensus on whether patients with previous induced abortions have any adverse pregnancy outcomes in the future.

There are many theories postulated regarding how previous abortions may predispose to sequelae like

cervical incompetence, miscarriage or spontaneous preterm labor in subsequent pregnancies. Cervix is normally rigid and tightly closed. During abortion cervix is dilated forcefully which causes microscopic tearing of the cervix muscles. This causes permanent weakening of the cervix which leads to cervical incompetence as the cervix is unable to carry the weight of a later wanted pregnancy, opens up prematurely and causes miscarriage or preterm labor.³

In this study authors aim to compare ultrasound measured cervical length in pregnant women with previous induced abortion versus those who have not had an induced abortion. Authors also aim to compare various pregnancy outcomes between the two groups including short cervix, second-trimester miscarriage, threatened preterm labour, PPROM, and spontaneous preterm delivery.

METHODS

This was a prospective observational study performed over one year period at a private tertiary care institution. Total of 400 patients were recruited, divided into two groups of 200 each. Patients who had a history of induced abortion in previous pregnancy (irrespective of their parity) were included as cases and those with no history of prior induced abortions (irrespective of their parity) were taken as controls. Patients with multiple gestation, indicated preterm delivery, and those undergoing emergency cervical cerclage in present pregnancy were excluded from the study.

Ethical committee clearance was obtained. Informed consents were taken from all participants. Patient’s demographic details, detailed history of pregnancy-related events were noted. All participants underwent transvaginal ultrasound measurement of cervical length at 11-14 weeks, 18-22 weeks and 28-32 weeks. Standard sonography techniques were used for measurement of cervical length by experienced sonographers. Pregnancies were followed up till delivery, to note the incidence of spontaneous preterm labour, PPROM, threatened preterm labour, and second trimester miscarriage.

RESULTS

In our study, mean age among cases was 30years and among controls being 29years. Average BMI among control and cases was 26kg/m² and 27kg/m² respectively. Both groups were well matched in term of age and BMI.

Cervical length was measured in both groups at different period of gestations: 11-14weeks, 18-22weeks and 28-32 weeks. In our study, mean cervical length among controls and cases (Figure 1) was 3.47 cm and 3.48 cm respectively at 11-14weeks (p=0.624), 3.44 cm and 3.49cm respectively at 18-22weeks (p=0.657); 3.36 cm and 3.42 cm respectively at 28-32 weeks (p=0.761). So, there was no significant difference in the cervical length

of pregnant patients with or without a history of prior induced abortions.

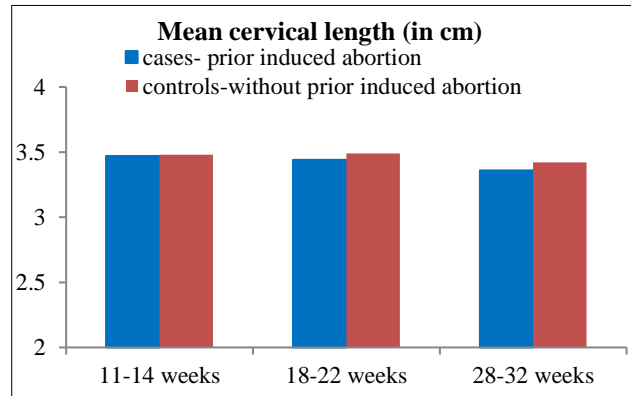


Figure 1: Mean cervical length at different periods of gestation in cases and controls.

Various outcomes like the incidence of short cervix, second-trimester miscarriages, threatened preterm, PPROM and spontaneous preterm delivery, were studied in both groups. Table 1 depicts the comparison of outcomes in controls and cases.

Table 1: Comparison of adverse pregnancy outcomes in controls and cases.

Outcomes	Case N: 200	Controls N: 200	Test of significance
Short cervix (<2.5cm)	11 (5.5%)	10 (5%)	P=0.5
2 nd trimester miscarriage	2 (1%)	1 (0.5%)	P=0.56
PPROM	7 (3.5%)	1 (0.5%)	P=0.033
Spontaneous preterm delivery	13 (6.5%)	3 (1.5%)	P=0.009
Threatened Preterm	23 (11.5%)	8 (4%)	P=0.004

Table 2: Comparison of outcomes with number of previous induced abortions.

Outcomes	Induced abortion ≤2 N:186	Induced abortion >2 N:14	Test of significance
Short cervix (<2.5cm)	8 (4.3%)	3 (21.4%)	P=0.032
2 nd trimester miscarriage	1 (0.5%)	1 (7.1%)	P=0.135
PPROM	5 (2.7%)	2 (14.3%)	P=0.079
Spontaneous preterm delivery	13 (5.4%)	3 (21.4%)	P=0.050
Threatened preterm	20 (10.8%)	3 (21.4%)	P=0.207

The incidence of short cervix was similar, i.e., about 5% in both study populations. Also, there was no significant difference in the incidence of second-trimester miscarriages in control and cases. However, there was a demonstrably increased risk of spontaneous preterm labour, PPRM and threatened preterm in patients with a history of prior induced abortion.

Authors analyzed the outcomes with respect to the number of previous induced abortions, method used for the induction process and gestation at which previous abortion was induced.

As described in Table 2, women who have had >2 previous induced abortions were at a higher risk of developing short cervix any time in pregnancy and also to have a spontaneous preterm delivery, compared to those who have had 2 or less previous induced abortions. There was also a higher incidence of PPRM among those who have had >2 prior induced abortions, although this difference did not reach statistical significance.

Next authors studied if gestational age of previous induced abortion affected pregnancy outcomes.

Table 3: Comparison of outcomes with respect to gestation of induced abortion.

Outcomes	1 st Trimester N:191	2 nd Trimester N:9	Test of significance
Short cervix	9 (4.7%)	2 (22.2%)	P=0.080
PPROM	6 (3.1%)	1 (11.1%)	P=0.279
Spontaneous preterm labour	20 (10.5%)	3 (33.3%)	P=0.071
Threatened Preterm	10 (5.2%)	3 (33.3%)	P=0.014

It was found that those who have had second trimester terminations were at a higher risk of adverse outcomes compared to those who have had first trimester induced abortion. Trend was obvious in all adverse pregnancy outcomes, although the statistical significance reached only for threatened preterm labour (Table 3).

Table 4: Comparison of outcomes to method of induction of abortion.

Outcomes	Medical N:102	Surgical N:98	Test of significance
Short cervix	3 (2.9%)	8 (8.2%)	P=0.095
PPROM	2 (2%)	5 (5.1%)	P=0.206
Spontaneous preterm labour	5 (4.9%)	8 (8.2%)	P=0.259
Threatened Preterm	8 (7.8%)	15 (15.3%)	P=0.076

Authors also studied the effect of different methods used for inducing abortion, i.e., either medical or surgical.

Although the incidence of adverse outcomes was higher among those who underwent surgical methods of abortion; there was no statistically significant difference between the groups (Table 4).

DISCUSSION

Many studies have focused on the effects of induced abortion on women's future pregnancy. Data seems clear on the increased risk of spontaneous PTD/PPROM/second trimester miscarriage among women who have had prior induced abortion.⁴⁻⁷ Similar to the above results, authors found that previous induced abortion increases the risk of threatened preterm, PPRM, spontaneous preterm delivery in the subsequent pregnancy (Table 1). Although authors did not find a statistically significant difference, the trend of increased adverse outcome, however, was obvious in the group who has had a surgical evacuation, compared to medical abortion (Table 4). In a meta-analysis on the effect of surgically induced abortion, it was found that history of dilatation and evacuation is an independent risk factor for preterm delivery.⁵⁻⁷ As found in our study, the risk of spontaneous preterm delivery increased with number of previous induced abortions, few studies do support the fact that the risk of preterm birth also depends on number of previous induced abortions and women with two or more previous induced abortions are at higher risk.⁸ There was a higher risk of SPTD and short cervix in the group who have had a second trimester induced abortion, compared to those who have had a first trimester abortion (Table 2). Again, this increased risk did not reach the level of statistical significance. To summarize, women who have had previous induced abortion seemed to have a higher risk of SPTD/PPROM/threatened PTL in their future pregnancy; and this risk seems to increase with second trimester abortion, surgical evacuation, and >2 previous abortions.

Next question to be answered is whether this increased risk of SPTD can be predicted in this group of women. One of the most useful tests to predict SPTD in modern obstetrics is TVS cervical length measurement. In our study however, mean cervical length was comparable in both groups. This implied that the risk of threatened preterm, PPRM, spontaneous preterm delivery is not predictable by measuring cervical length among these women. Contrary to our results, a retrospective cohort study including about 700 women, concluded that women with one or more prior induced abortion with cervical dilatation/surgical evacuation, have a 2-3 fold higher risk of developing short cervix in the midtrimester of subsequent pregnancy⁹. In this study, impact of induced abortion on cervical length was studied however other adverse pregnancy outcomes like SPTD were not analyzed. Finally, in a study performed in the USA, it was found that, women with prior induced abortion have

a higher prevalence of short cervix between 14 to 24 weeks, and short cervix at this gestation is highly predictive of SPTD in this group¹⁰. These are contrary to our results on predictive value of cervical length in this group of women. Therefore literature is clear on increased risk of spontaneous preterm delivery among those with previous induced abortion, but unclear on whether this complication can be predicted using cervical length measurements. Hence there is scope for further research in this area.

Limitation in our study was small sample size. In addition, patients included in our study population had other potential confounding risk factors like assisted conception, previous preterm labor, which could not be matched. Also, effect of parity on further pregnancy outcome is not matched and this might have affected the results.

CONCLUSION

In our study, authors found that there is no significant difference in the cervical length of pregnant patients with or without history of prior induced abortions. However, authors found that the risk of spontaneous preterm labour, PPRM and threatened preterm was increased in patients with prior induced abortion. Also, there is significant association in occurrence of spontaneous preterm labour and short cervix in patients with >2 abortion.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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