ORIGINAL ARTICLE

# Preterm Birth in Pregnant Women with Cervical Incompetence having Cervical Cerclage at a tertiary care hospital

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## ABSTRACT

**Background;** Cervical Cerclage has been reported to prevent preterm births in females having cervical incompetence who have prior history of preterm births. This study was conducted to document frequency of preterm labor in women with cervical incompetence having cervical cerclage.
**Aim:** To determine frequency of preterm labor in pregnant women with cervical incompetence having cervical cerclage at a tertiary care hospital.
**Methods;** This descriptive case series was done at department of obstetrics and gynecology, Unit I Nishtar Hospital Multan which is a tertiary care hospital using non – probability purposive sampling technique. A total of 156 patients with Cervical incompetence (Cervical length less than 25 mm at 24 weeks of gestational age (on ultrasound) were included. Purse string suture was applied at cervicovaginal junction, without bladder mobilization under general anesthesia. Patients were monitored for 24 – 48 hours post – operatively and were asked to refrain from heavy physical activities and coitus.
**Results:** Mean age of these patients was noted to be 28.10±4.09 years and 104(66.7%) patients were aged 20–30 years. History of diabetes was present in 21(13.5%) and hypertension in 31(19.9%). Mean height of our study cases was 161.31±5.22 centimeters while mean weight was noted to be 56.23±6.21 kilograms. Mean BMI was 23.41±2.47kg/m$^2$ and obesity was present in 33(21.2%). Mean inter-pregnancy interval was noted to be 10.45±5.67 months while short interpregnancy interval was noted in 42(26.9%) of our study cases. Elective cerclage was present in 114(73.1%) while emergency cerclage was present in 42(26.9%) study cases. Mean parity was 3.47±1.19 and 113(72.4%) study cases had parity up to 4 while mean gravidity was 5.13±1.87 and 105(67.3%) had gravidity more than 5. Mean gestational age at the time recruitment of our study cases was 12.64±0.99 weeks while mean gestational age at delivery was noted to be 38.74 ± 2.17 weeks. Preterm labor was noted in 32(20.5%) of our study cases.
**Conclusion:** Cervical cerclage is an effective procedure for the prevention of preterm births as the frequency of preterm labor was low in women with cervical vaginal cerclage having previous recurrent preterm births in our study. There were no major adverse side effects of the treatment and hence can be employed safely. Preterm labor was significantly associated with history of diabetes, hypertension, obesity, gravidity and type of cerclage.
**Keywords:** Preterm labor, cervical incompetence, cervical cerclage

## INTRODUCTION

Preterm birth rate continues to rise around the world[1]. Preterm birth is related with significant increase in proportions of infant mortalities and also through young childhood[2,3]. Shorter duration of gestational age has been implicated as a strong predictor for offspring morbidities throughout their lifespan such as various psychiatric disorders, educational problems, poor physical activity, low productivity and social difficulties[4-6]. Preterm births are regarded one of the most common issues related with maternal – child health all over the world[7]. Data from developed nations indicate preterm births complicating one out of eight births and harbors approximately over 85% of all perinatal adverse outcomes including neonatal mortality[8,9]. Due to recent advancements in obstetric care, clinicians have been able to identify pregnant ladies with increased risk of preterm birth (as a results of transvaginal cervical length measurement and cervicovaginal fetal fibronectin testing), however efforts to prevent preterm births have largely remained unsuccessful[10]. Prevention of

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preterm births remains challenge in contemporary obstetrics and demands more sophisticated procedures and expertise[11].

Cervical cerclage involves to place stitches for holding the cervix to remain closed during course of pregnancy and has been shown to be effective in preventing preterm births and pregnancy loss. Cervical cerclage, in some cases has also been employed to keep incompetent cervix to open early which may otherwise lead to preterm labor and delivery. Placement of cervical cerclage in females with positive history of spontaneous preterm birth and those having cervical length less than 25 mm is shown to prevent burden of preterm births and other adverse perinatal outcome[12,13]. Shamshad et al[14] reported 18.7% preterm births in patients with cervical cerclage. Memon et al[15] reported 34.15% preterm births in patients having cervical cerclage. Naz et al[16] reported 9% preterm births in patients having cervical cerclage.

Varying frequencies of preterm births have been reported in Pakistan i.e. 9%-34.15%[14–16]. The reason for this large difference is that two studies were retrospective[14,15] while only one prospective study is available[16]. This prospective study was done with very small sample size of 33 patients[16] which is not enough to

generalize on our large population. Keeping these facts in mind, we planned to conduct this study in my local population with reasonable sample size to give more authentic and reliable results on this topic. The results of this study will help clinicians to manage such cases properly which will ultimately result in the reduction of preterm births which is associated with perinatal morbidity and mortality. The results of my study was compared with those already reported in literature from different parts of world. The study results will generate useful database of our local population.

## MATERIAL AND METHODS

This descriptive case series was done at department of obstetrics and gynecology, Unit I Nishtar Hospital Multan which is a tertiary care hospital using non–probability purposive sampling technique. A total of 156 patients with Cervical incompetence (Cervical length less than 25mm at 24 weeks of gestational age (on ultrasound) with history of recurrent mid trimester pregnancy loss and preterm deliveries being reported at least twice, aged 20–40 years, parity more than 1 with gestational age 11–14 weeks (on LMP) were included. Patients with history of painful uterine contractions, vaginal bleeding and presence of fetal anomalies, multiple pregnancies, UTI and pre-eclampsia, uterine anomalies (Mullerian duct abnormalities) or cervical trauma (History of cone biopsy, large loop excision of transformation zone, diathermy or ablation were excluded from our study. Sample Size is 156, calculated by following formula. $n=z^2pq/d^2$, p=9%[16] (hypothesized frequency of preterm labor having cervical cerclage), q=100-p, d=4.5%. Transvaginal ultrasonography was employed in all out study cases to measure cervical length, diameter and funneling. Patients were admitted a day before operation. Transvaginal McDonald suture was chosen for its simple technique. Purse string suture was applied at cervicovaginal junction, without bladder mobilization under general anesthesia. Patients were monitored for 24–48 hours postoperatively and were asked to refrain from heavy physical activities and coitus. Suture was removed at 37 completed weeks and patients were observed for 2–4 hours afterwards and were followed till delivery for preterm birth. Data was entered analyzed by using SPSS Version 23. Mean and standard deviation were calculated for age of patients, height, weight, BMI, interpregnancy interval, gravidity, parity and gestational age. Frequencies and percentages were tabulated for obesity, short interpregnancy interval, age groups and preterm labor. Effect modifiers like age, gestational age, diabetes, hypertension, Obesity, Type of cerclage (elective/emergency), parity, interpregnancy interval and gravidity were controlled by applying chi – square test at 0.05 level of significance (95 % CI).

## RESULTS

Our study included a total of 156 study cases with their mean age was 28.10±4.09 years and 104(66.7%) were aged 20–30 years. History of diabetes was present in 21(13.5%) and hypertension in 31(19.9%). Mean height was 161.31±5.22 centimeters while mean weight was noted to be 56.23±6.21 kilograms and mean BMI of our study

cases was 23.41±2.47kg/m² whereas obesity was present in 33(21.2%). Mean inter-pregnancy interval was noted to be 10.45±5.67 months while short interpregnancy interval was noted in 42(26.9%) of our study cases. Elective cerclage was present in 114(73.1%) while emergency cerclage was present in 42(26.9%) study cases. Mean parity was 3.47±1.19 and 113(72.4%) study cases had parity up to 4 while mean gravidity was 5.13±1.87 and 105(67.3%) had gravidity more than 5. Mean gestational age at the time recruitment of our study cases was 12.64±0.99 weeks while mean gestational age at delivery was noted to be 38.74±2.17 weeks. Preterm labor was noted in 32(20.5%) of our study cases. Preterm labor was stratified with regards to age, diabetes, hypertension, obesity, short inter-pregnancy interval, type of cerclage, parity and gravidity.

Table 1: Stratification of preterm labor with regards to age (n= 56)

| Age groups | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| 20 – 30 Years (n = 104) | 22 | 82 |
| 31 – 40 Years (n = 52) | 10 | 42 |

P value 0.836

Table 2: Stratification of preterm labor with regards to diabetes

| Diabetes | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| **Yes** (n = 21) | 10 | 11 |
| **No** (n =135) | 22 | 113 |

P value 0.002

Table 3: Stratification of preterm labor with regards to hypertension

| Hypertension | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| **Yes** (n = 31) | 00 | 31 |
| **No** (n =125) | 32 | 93 |

P value 0.000

Table 4: Stratification of preterm labor with regards to obesity

| Obesity | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| **Yes** (n = 33) | 12 | 21 |
| **No** (n =123) | 20 | 103 |

P value 0.016

Table 5: Stratification of preterm labor with regards to parity

| Parity | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| Equal or less than 4(n=113) | 22 | 91 |
| More than 4(n=43) | 10 | 33 |

P value 0.659

Table 6: Stratification of preterm labor with regards to short inter-pregnancy interval (n = 156)

| Short Interpregnancy Interval | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| Yes | 21 | 21 |
| No | 11 | 103 |

P value 0.000

Table 7: Stratification of preterm labor with regards to type of cerclage (n = 156)

| Type of Cerclage | Preterm labor | |
|---|---|---|
| | **Yes** (n = 32) | **No** (n =124) |
| Elective | 11 | 103 |
| Emergency | 21 | 21 |

P value 0.000

## DISCUSSION

Cervical cerclage involves the placement of sutures during pregnancy around neck of cervix to provide cervix with mechanical support to reduce the risk of preterm deliveries in these pregnant ladies [17-18]. Mean age of our study cases was noted to be 28.10±4.09 years while 104(66.7%) were aged 20–30 years with 23 years was minimum age while maximum age was 39 years. Zhu et al [19] also reported 29.18±3.52 years mean age of the women with cervical cerclage (with range; 23–37 years), similar to our results. A study conducted by Yassaee et al[20] also documented 27.8±4.7 years mean age, similar to our findings. Shamshad et al[14] from Ayub Hospital, Abbottabad also reported similar results consistent to our findings.

Diabetes was present in 21(13.5%) and hypertension in 31(19.9%), mean height was 161.31±5.22 centimeters while mean weight was noted to be 56.23±6.21 kilograms. Mean BMI of our study cases was 23.41±2.47 kg/m$^2$ and obesity was present in 33(21.2%). Mean inter-pregnancy interval was noted to be 10.45±5.67 months while short interpregnancy interval was noted in 42(26.9%) of our study cases. Elective cerclage was present in 114(73.1%) while emergency cerclage was present in 42(26.9%) study cases. Shamshad et al[14] from Abbottabad also reported 81% patients had elective cerclage while 19% had emergency cerclage which is similar to that of our study results.

Mean parity was 3.47±1.19 and 113(72.4%) study cases had parity up to 4 while mean gravidity was 5.13±1.87 and 105(67.3%) had gravidity more than 5. Shamshad et al[14] from Abbottabad also reported similar results.

Mean gestational age at the time recruitment of our study cases was 12.64±0.99 weeks while mean gestational age at the time of delivery was noted to be 38.74±2.17 weeks. Our findings are in compliance with that of Shamshad et al [14] and Memon et al[15].

Preterm labor was noted in 32(20.5%) of our study cases. A study conducted by Yassaee et al [20] also reported 23.8% preterm deliveries in women with cervical cerclage, similar to our results. Shamshad et al[14] from Abbottabad also reported 18.7% preterm labor, close to our results. Memon et al[15] also reported 34.15% preterm births. A study conducted by Naz et al[16] from Karachi reported 9% preterm births which is lower than that being reported in our study.

## CONCLUSION

Cervical cerclage is an effective procedure for the prevention of preterm births as the frequency of preterm labor was low in women with cervical cerclage having previous recurrent preterm births in our study. There were no major adverse side effects of the treatment and hence can be employed safely. Preterm labor was significantly associated with history of diabetes, hypertension, obesity, gravidity and type of cerclage.

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