

ORIGINAL ARTICLE

SUCCESS RATE OF CERVICAL CERCLAGE IN PREVENTING PRETERM LABOUR

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Background: Cervical cerclage has been reported to improve cervical length and restore cervical anatomic relationships. Cerclage placement closer to internal os may be associated with improved perinatal outcome. This study was designed to determine the success rate of cervical cerclage in preventing preterm deliveries in patients having cervical incompetence. **Methods:** Seventy-five subjects were selected by consecutive (non-probability) sampling technique. All patients were having a history of two or more recurrent mid trimester abortions or preterm deliveries and were subjected to cervical cerclage. Age, gravidity, and parity of the patients, and gestational age at delivery, weight of the baby and Apgar score was recorded. Success rate of cervical cerclage was calculated. **Results:** The mean age of the patients was 28.35 ± 3.96 year, gestation number was 5.33 ± 2.36 , and parity was 1.7 ± 1.46 . Most (65.3%) of the cases delivered at term (>37 weeks), 17.3% had preterm deliveries (28–37 weeks) and 17.3% had abortions (12–28 weeks). Sixty-four percent of babies had birth weight ≥ 2.5 Kg, and 36.0% had birth weight < 2.5 Kg. Foetal survival rate (good Apgar score) was 76%. Overall success rate of cervical cerclage was 80%. **Conclusion:** Application of cervical cerclage in pregnant women with previous preterm delivery reduces the preterm delivery rate at a reasonable cost with no additional risk to the mother and the foetus.

Keywords: Cervical cerclage, Preterm delivery, cervical incompetence, transvaginal ultrasonography

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INTRODUCTION

Cervical cerclage is a surgical procedure involving suturing the cervix with a purse type stitch to keep it closed during pregnancy.¹ Cervical cerclage can be done preferably at 12–14 weeks of conception before the cervix thins out.² Main indications of cervical cerclage are previous second trimester pregnancy loss or delivery that occurred with few or no contractions and cervical trauma or injury leading to cervical incompetence.³ Cervix is labelled incompetent when it is unable to retain an intrauterine gestation until term. It plays an important role in supporting a pregnancy and preventing ascending infection. Infection is associated with early preterm delivery in half of these cases.⁴ Whatever the aetiology of preterm delivery, dilation of the cervix is a common end-point.

Diagnosis is mostly clinical. Past obstetrical histories of recurrent mid trimester miscarriage or preterm delivery are the basis for the application of cerclage. Pervaginal or digital examination may show patulous or bulging membranes and may confirm diagnosis but have not shown to improve outcome.⁵ Ultrasound is the principal modality used during pregnancy to measure cervical length and opening. In non-pregnant ladies Hegar's test, Foley's catheter extraction, Hystero-gram and Hystero-scopy can be used. Cervical resistance index and cervical compliance score are other investigations.⁶

Previous preterm delivery has been shown to be indicator for subsequent preterm delivery. History

of one previous preterm delivery has been shown to be associated with a recurrence risk of 17–40%, the risk increasing with the number of preterm births.⁷ More than 85% long term disabilities in otherwise healthy babies and 75% deaths among newborns occur as a result of preterm delivery.⁷ The exact mechanism of preterm labour is largely unknown but is believed to include decidual haemorrhage, cervical incompetence, uterine distortion, cervical inflammation, maternal inflammation/fever, hormonal changes, and utero-placental insufficiency.⁸

Interventions designed to reduce preterm births include the introduction of standard prenatal care in an area where there was previously little or no care and the use of enhanced rather than routine prenatal care.⁹ Enhancing prenatal care by adding combinations of patient education, case management, home visiting, and nutrition counselling appeared to be effective in reducing preterm births in a few randomized trials but not in most.¹⁰ An 'incompetent' or structurally weak, cervix is diagnosed in 1 in 200 to 1 in 1,000 pregnant women on the basis of a history of spontaneous second trimester preterm birth in the absence of recognizable uterine contractions.¹¹ The traditional treatment has been the placement of one or several circumferential stitches (cerclage) in the cervix.

Whether women with history of second-trimester birth in the absence of recognizable contractions benefit from cerclage has not been tested prospectively, but comparisons with historical controls

suggest a benefit. Cerclage resulted in a statistically significant reduction in the rate of preterm birth before 33 weeks.¹² Cerclage has been reported to improve cervical length and restore cervical anatomic relationships.¹³ It has been suggested that cerclage placement closer to internal may be associated with improved perinatal outcome.¹⁴

Since the development of transvaginal ultrasound, short cervical length has been recognized as one of the most accurate predictor of preterm birth. Cervical length less than 25 mm is considered incompetent when uterine contractions are absent.^{15,16} It recognizes an early asymptomatic phase that precedes symptomatic preterm labour or premature rupture of membranes better than manual examinations and has been shown to be one of the best predictor of preterm birth.^{17,18} A screening test such as transvaginal ultrasound can be beneficial only if an effective intervention can prevent the outcomes. The only two previous trials on cerclage as an intervention to decrease preterm birth in women with a short cervix that was found on transvaginal ultrasound have shown contradictory result.¹⁹⁻²¹

This study was designed to determine the success rate of cervical cerclage in preventing preterm deliveries in patients having cervical incompetence.

MATERIAL AND METHODS

It was a prospective observational study conducted from January 2013 to January 2014 in the Department of Obstetrics & Gynaecology, Khyber Teaching Hospital (KTH), Peshawar, Pakistan. Keeping the success rate as 73.3% with cervical cerclage, confidence level of 95% and precision of 10% the sample size was calculated to be 75.

Pregnant women having history of previous 2 or more second trimester miscarriages, 2 or more preterm deliveries, or having cervical length less than 25 mm on transvaginal ultrasound were included in the study.

Pregnant women having preterm deliveries due to preeclampsia and eclampsia, multiple pregnancies, and polyhydramnias were excluded from the present study.

After getting approval from the Ethical Committee of Khyber Teaching Hospital, informed written consent was taken from all patients. Patients were enrolled from the antenatal clinic of Khyber Teaching Hospital Peshawar, and included in the study if fulfilling the selection criteria.

Age, obstetrical history, history of current pregnancy, and gestational age was recorded. Confounding variables like genital tract infections, uterine anomalies, fibroid uterus and contraceptive device were controlled on the basis of detailed history, physical examination, and ultrasonography from

Radiology Department of Khyber Teaching Hospital, Peshawar. Abdominal examination and transvaginal ultrasound were carried out by a single ultrasonographer using standardized ultrasound facility available in the hospital to control any observer bias.

Cervical cerclage was applied to patients and the patients were booked for antenatal care and confinement. The cerclage was placed between 12 weeks and 14 weeks of pregnancy and was removed around the 37th week of gestation. Antenatal checkups were done according to standard protocol. Any complications arising were treated accordingly.

In patients presenting in labour, detailed examination including per abdomen, per vaginam if indicated, and per speculum were carried out. Gestational age at the time of delivery, Apgar score at 5 minutes, and individual weights of the babies were recorded.

All information was entered on SPSS-10 and analysed. Age, gravidity, and parity were presented as mean and standard deviation, and gestational age at the time of delivery, weight of the baby and Apgar score were presented as frequencies and percentages. Success rate of the term deliveries after application of cerclage was calculated.

RESULTS

Average age of the 75 patients was 28.35±3.96 years. Most (42, 56%) of the patients were in the age group of 26–30 years, 19 (25.3%) were in the age group of 20–25 years, 19 (25.3%) were in the age group of 31–35 and 5 (6.7%) were of age greater than 35 years.

Average gravidity of patients was 5.33±2.36. Most (46, 61.3%) of them were of gravida 2–5, 23 (30.7%) were gravida 6–9, and 6 (8%) were more than gravida 9.

Average parity of patients was 1.7±1.46. Most (52, 69.3%) of them were para 0–2, 22 (29.3%) were para 3–5, and 1 (1.3%) was para more than 5.

Among the 75 patients, 49 (65.3%) were delivered at term (greater than 37 weeks), 13 (17.3%) had preterm deliveries and 13 (17.3%) had abortions. (Table-1).

Most (48, 64.0%) of the babies in our study had birth weight more than or equal to 2.5 Kg, while 27 (36%) had birth weight less than 2.5 Kg. The Apgar score (foetal survival) of most (57, 76.0%) of the babies at 5 minutes after birth was more than 7 while 18 (24%) had Apgar score less than 7. (Table-2).

Over all, the success was observed in 60 (80%) cases which were stratified among the age. The success rate was high in the age group <30 years. (Table-3).

Table-1: Age, gravidity, parity and period of gestation of the patients (n=75)

Parameter	Frequency	Percentage
Age (Years)		
20–25	19	25.3
26–30	42	56.0
31–35	9	12.0
>35	5	6.7
Gravidity		
2–5	46	61.3
6–9	23	30.7
>9	6	8.0
Parity		
0–2	52	69.3
3–5	22	29.3
>5	1	1.3
Period of Gestation		
12–28 weeks	13	17.3
29–37 weeks	13	17.3
>37 weeks	49	65.3

Table-2: Birth weight and Apgar score of the babies (n=75)

Parameter	Frequency	Percentage
Birth weight		
<2.5	27	36
≥2.5	48	64
Apgar score		
<7	18	24
>7	57	76

Table-3: Success rate of cervical cerclage in different age groups [n (%)] (n=75)

Age in years	Success		Total
	No	Yes	
20–25	5 (6.7)	14 (18.7)	19 (25.3)
26–30	8 (10.7)	34 (45.3)	42 (56.0)
31–35	2 (2.7)	7 (9.3)	9 (12.0)
>35	00 (00)	5 (6.7)	5 (6.7)

DISCUSSION

Cervical cerclage is applied to prevent preterm delivery and hence the complications of preterm delivery. Cervical incompetence is recognized in reproductive age group due to its clinical impact on the reproductive function. Our study represents 20–40 year age group which is the peak reproductive age among women. Most of our patients were of low parity (0–2) which is quite reflective of the condition that leads to adverse outcome. The same is supported by a study by Shennan A.²²

Shamshad *et al*⁵ conducted a descriptive cross-sectional study over a 2 year period on patients having history of 2 or more recurrent mid-trimester abortions/preterm deliveries. They reported 73.7% of term delivery after application of cervical cerclage, 18.7% of premature delivery and 7.5% of miscarriages. Our results are very close to Shamshad *et al*.⁵ Another study by Clen *et al*²³ also demonstrated 76% of term deliveries, 12% preterm deliveries and 10% of abortions. The slight difference of term delivery in our study as compared to the 73.7% reported by Shamshad *et al*⁵ and 76% reported by Clen *et al*²³ was because we

took the cut-off value of term delivery at >37 weeks gestation while they considered 35 weeks gestation as term pregnancy. Moreover we had to remove the cerclage electively from 2 out of 75 patients (2.6%) at 35 weeks gestation due to the complain of decrease foetal movements as they had bad previous obstetrical history. Three out of 75 patients (4%) had placental abruption and 1 out of 75 patients (1.3%) developed chorioamnionitis between the gestational ages of 28–37 weeks due to which cervical cerclage was removed electively. These factors also added to the slight difference in the term delivery rate.

Good Apgar score at 5 minutes after birth is a sign of better survival of neonate. In our study 57 out of 75 patients (76%) had good Apgar score at 5 minutes. Cervical cerclage improves foetal survival rate which is also supported by previous studies.²⁴

Low birth weight babies, i.e., less than 2.5 Kg have high perinatal morbidity and mortality. In our study 64% had birth weight ≥2.5 Kg which shows that cervical cerclage improves neonatal survival and decreases perinatal morbidity. This has also been demonstrated by Ezechi OC⁷ who demonstrated 71% of babies having birth weight greater than 2.5 Kg. The slight difference in our study may be due to the fact that the people of our setup were poor and were having low socioeconomic and nutritional status which might had contributed to low birth weight of the babies.

Overall success rate of cervical cerclage was found to be 80% which was stratified among the age which shows that the success rate was high in the age less than 30 years. This is mainly because as age increases reproductive functions decreases. The same is also supported by previous studies.^{25–26}

The effectiveness of cervical cerclage in women with cervical incompetence using McDonald procedure increased the rate of term deliveries to 95.4%. Lotgering FK *et al*²¹ have reported mean gestational age at delivery in their subjects as 35 weeks. Shennan A, Jones B²² reported 7.5% of miscarriages, 18.7% of premature deliveries, 73.7% of term deliveries and 85.1% of foetal survival rate (good Apgar score) after cervical cerclage in patients having sonographically incompetent cervix.

Observational studies show that in classical cases with a severely traumatized or virtually absent cervix, neonatal survival may be up to 93% after effective cerclage as compared to 27% before the cerclage.²⁷

CONCLUSION & RECOMMENDATIONS

Prophylactic cervical cerclage is a successful way of treating cervical incompetence. Cervical cordage should be considered for those patients who have previous history of recurrent mid-trimester pregnancy losses and preterm deliveries.

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