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Obstetric Outcomes after Cervical Cerclage in Women with Cervical Insufficiency

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ABSTRACT

Most of the local studies in Pakistan have focused only on the prevention of preterm labour after cervical cerclage in women with cervical insufficiency. Still, these studies lack data regarding other outcomes like abortion and premature rupture of membranes after cervical cerclage in women with cervical insufficiency. **Objective:** To determine the obstetric outcomes after cervical cerclage in women with cervical insufficiency. **Methods:** This descriptive study was carried out at the Gynaecology Department, Khyber Teaching Hospital, during the period 22nd May 2024 till 31st March 2025. Women aged 18-35 years with gestational age 13 to 20 weeks and transvaginal ultrasound showing cervical length <2.5cm were enrolled. Cervical cerclage was performed, and pregnancy outcomes were noted in terms of miscarriage, preterm, PROM, prolonged pregnancy and term pregnancy. **Results:** Mean age of the participants was 30.42 ± 5.616 years, mean BMI was 24.070 ± 2.704kg/m2 and mean gestational age was 24.37 ± 4.844 weeks. 85 patients (50.3%) were aged more than 30 years. Participants with parity up to 3 were 94 (55.6%), and 126 patients (74.6%) were housewives. Preterm was the most common pregnancy outcome, recorded in 58 patients (34.3%), 34 patients (20.1%) had a term pregnancy, and prolonged labor was the least common (n=8, 4.7%). **Conclusions:** Preterm delivery was the most common pregnancy outcome after cervical cerclage in this cohort of patients. However, a reasonable number of patients were found with a term pregnancy, showing the adequate prolongation of pregnancy with cerclage in cervical insufficiency.

INTRODUCTION

The demise of conception in the middle month and preterm delivery are significantly influenced by cervical insufficiency. It is characterized as the cervix's anatomical or functional impairment that prevents it from supporting a pregnancy until full term [1]. Characteristics of cervical incapacity frequently encompass uncomfortable dilatation of the cervical canal without spasms or intrauterine infections, as well as a previous preterm delivery or repeated mid-trimester miscarriage [2]. Frequently, labor is brief, and the early fetus is born alive. About 15% of pregnancy-related failures around 16 and 28 weeks are thought to be caused by cervical incompetence, which is believed to occur at a rate of 0.1% to 2% [3]. Mechanically supporting a weak cervix is considered the primary aspect needed to sustain pregnancy in situations of cervical incompetence [4]. Shirodkar was the first to describe cervical cerclage, and McDonald subsequently made modifications [5]. To extend the gestation until a successful development, women experiencing dilatation of the cervical canal and protruding uterine membranes in the middle of the third trimester may have urgent cervical cerclage surgery as a rescue treatment [6]. Nevertheless, the safety and efficacy of emergency cervical cerclage are still up for debate, and it has the potential to raise the probability of transmission since it exposes the fetal membranes to more genital infectious agents [7]. The cervix is made up of blood vessels and fibromuscular tissue. Although it makes up 15% of the cervical stroma,

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muscular connective tissue has an uneven distribution across various levels of the cervix. Early cervical dilatation and miscarriage are believed to result from anomalies in fibromuscular tissue. Cervical insufficiency danger can be accurately predicted among individuals by transvaginal ultrasound assessment of the cervix. Sonographic indicators for this obstetrical syndrome include dilatation of the cervical opening (internal OS), shortening of the endocervical canal length [8]. A study by Prasad *et al.*, has shown that the frequency of abortion was 12.5%, Premature Rupture of Membranes 25%, and preterm labour was 42% after cervical cerclage in women with cervical insufficiency [9]. He *et al.*, in another study, have shown that the frequency of live birth was 82.28% after cervical cerclage in women with cervical insufficiency [1]. Chan *et al.*, in another study, have shown that the frequency of prolonged pregnancy was 61.7% after cervical cerclage in women with cervical insufficiency [8]. Most of the local studies in Pakistan have focused only on the prevention of preterm labor after cervical cerclage in women with cervical insufficiency, but these studies lack data regarding other outcomes, like abortion, premature rupture of membranes after cervical cerclage in women with cervical insufficiency. Moreover, no such study has been done before in our part of the world (the northwestern region of the country), so the results of my study would not only provide further local evidence on this subject but also help to fill the gap outside Pakistan in neighboring countries.

The study aims to determine the obstetric outcomes after cervical cerclage in women with cervical insufficiency, as there is a paucity of data on this subject in our local population.

METHODS

This descriptive study was conducted at the Gynecology Department of Khyber Teaching Hospital, Peshawar. Participants were enrolled during the period from 22nd May 2024 till 31st March 2025. Approval for the conduct of the study was taken vide no 316/DME/KMC and CPSP/REU /OBG-2022-020-11423. Women aged 18 to 45 years, gestational age 13 to 20 weeks, prior history of cervical insufficiency in the previous pregnancy and cervical length less than 2.5cm on ultrasound were enrolled. Patients with a history of antiphospholipid syndrome, >4cm cervical dilatation on PV examination, uterine contraction with pain (VAS>3) and diabetic and hypertensive patients were excluded. Cervical insufficiency was confirmed on transvaginal ultrasound with cervical length <2.5cm. Pregnancy outcomes were noted in terms of miscarriage (expulsion of product of gestation before 24 weeks of gestation, PROM (pooling of amniotic fluid in the vaginal fornices before 37 weeks POG, prolonged labor (labor duration >20 hours) and term pregnancy. The sample size was 169, calculated using the WHO sample size formula, Open-epi software, taking a 5% margin of error, 95 % confidence level, taking the least expected percentage of abortion after cerclage in women with cervical insufficiency, i.e. 12.5% [9].The sampling technique was non-probability, convenient sampling. After approval from the hospital ethical board, patients fulfilling the inclusion criteria were enrolled. Basic demographics like age, gestational age, parity, cervix length, residence, education, profession and socioeconomic status were noted.The effects, procedure and possible side effects of cervical cerclage were explained to patients. Informed consent was taken from all enrolled participants. By hospital practice, patients had the routine preoperative assessment and care was given. General anesthesia was used throughout the whole surgery. Lithotomy posture was applied.The surgical region was scrubbed and draped, and then a round-bodied needle was used to apply silk at the level of the internal cervical os. All the procedures were done by a consultant gynecologist. Post operatively patients were observed for any contractions, vaginal leak or bleed.Fetal cardiac activity was checked before discharge.The patient was discharged on the first post-operative day. Following discharge, avoidance of coitus was advised. Patients were followed up till delivery (patients who were lost to follow-up were contacted by phone and reminded of their appointment), cervical cerclage was removed at the end of 37 weeks' gestation, electively or in emergency, when patients came in with preterm labor. Obstetric outcomes were noted. Data were analyzed with a statistical analysis program (IBM-SPSS version 22.0).Frequency and percentage were computed for categorical variables like residence, education, profession, and socioeconomic status, history of preterm delivery, abortion, PROM, preterm labor, live birth and prolonged pregnancy.Mean ± SD was presented for quantitative variables like age, gestational age, parity, cervical length, weight and BMI. Stratification was done about age, gestational age, parity, history of preterm delivery, cervical length and BMI to control the effect of modifiers. Post-stratification, the chi-square test was used, keeping $p \leq 0.05$ as statistically significant.

RESULTS

In this study mean age of the participants was 30.42 ± 5.616 years, mean BMI was 24.070 ± 2.704kg/m2 and mean gestational age was 24.37 ± 4.844 weeks. 85 patients (50.3%) were aging more than 30 years. Participants with parity up to 3 were 94 (55.6%), and 126 patients (74.6%) were housewives (Table 1).

Table 1: Baseline Characteristics of Study Cohort (n=169)

Baseline Parameters		Frequency (%)
Age (Years)	30 or Below	84 (49.7%)
	More Than 30	85 (50.3%)
Parity	3 or Below	94 (55.6%)
	More Than 3	75 (44.4%)

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Education	Matric or Below	69 (40.8%)
	Above Matric	100 (59.2%)
Profession	Employed	43 (25.4%)
	House Wife	126 (74.6%)

Preterm was the most common obstetric outcome, recorded in 58 patients (34.3%), followed by miscarriage in 39 participants (23.1%). 34 patients (20.1%) had a term pregnancy. PROM was recorded in 30 participants (17.8%), and prolonged labor was least common (n=8, 4.7%) (Figure 1).

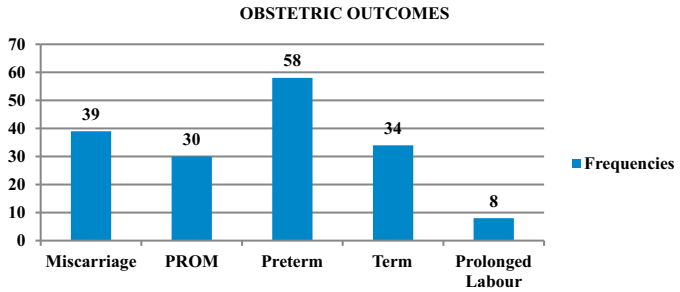

Figure 1: Obstetric Outcomes in Study Cohort (n=169)

Subgroup analysis of obstetric outcomes with patient age showed that the association did not reach statistical significance (p>0.05) (Table 2).

Table 2: Stratification of Obstetric Outcomes with Age (n=169)

Variables		Age (years)		Total	p-value
		30 or Below	More Than 30		
Miscarriage	Yes	17 (43.6%)	22 (56.4%)	39 (100.0%)	0.384
	No	67 (51.5%)	63 (48.5%)	130 (100.0%)	
PROM	Yes	16 (53.3%)	14 (46.7%)	30 (100.0%)	0.661
	No	68 (48.9%)	71 (51.1%)	139 (100.0%)	
Preterm	Yes	33 (56.9%)	25 (43.1%)	58 (100.0%)	0.176
	No	51 (45.9%)	60 (54.1%)	111 (100.0%)	
Term	Yes	17 (50.0%)	17 (50.0%)	34 (100.0%)	0.969
	No	67 (49.6%)	68 (50.4%)	135 (100.0%)	
Prolonged	Yes	5 (62.5%)	3 (37.5%)	8 (100.0%)	0.458
	No	79 (49.1%)	82 (50.9%)	161 (100.0%)	

Miscarriage was more frequent among patients with parity 3 or below (n=23, 59.0%); however, the chi-square p-value was 0.631. Though term pregnancy was more often in patients with parity above 3, the difference was statistically insignificant with a p-value of 0.131 (Table 3).

Table 3: Stratification of Obstetric Outcomes with Parity (n=169)

Variables		Parity		Total	p-value
		30 or Below	More Than 3		
Miscarriage	Yes	23 (59.0%)	16 (41.0%)	39 (100.0%)	0.631
	No	71 (54.6%)	59 (45.4%)	130 (100.0%)	
PROM	Yes	16 (53.3%)	14 (46.7%)	30 (100.0%)	0.781
	No	78 (56.1%)	61 (43.9%)	139 (100.0%)	
Preterm	Yes	30 (51.7%)	28 (48.3%)	58 (100.0%)	0.461
	No	64 (57.7%)	47 (42.3%)	111 (100.0%)	
Term	Yes	15 (44.1%)	19 (55.9%)	34 (100.0%)	0.131
	No	79 (58.5%)	56 (41.5%)	135 (100.0%)	
Prolonged	Yes	5 (62.5%)	3 (37.5%)	8 (100.0%)	0.688
	No	89 (55.3%)	72 (44.7%)	161 (100.0%)	

Subgroup analysis of obstetric outcomes with patient education status showed that 27 (79.4%) participants with an education level above matric achieved term pregnancy compared to 07 (20.6%) patients with an education level of matric or below. The chi-square p-value was 0.007 (Table 4).

Table 4: Stratification of Obstetric Outcomes with Education (n=169)

Variables		Education		Total	p-value
		Matric or Below	Above Matric		
Miscarriage	Yes	20 (51.3%)	19 (48.7%)	39 (100.0%)	0.130
	No	49 (37.7%)	81 (62.3%)	130 (100.0%)	
PROM	Yes	16 (53.3%)	14 (46.7%)	30 (100.0%)	0.124
	No	53 (38.1%)	86 (61.9%)	139 (100.0%)	
Preterm	Yes	27 (46.6%)	31 (53.4%)	58 (100.0%)	0.274
	No	42 (37.8%)	69 (62.2%)	111 (100.0%)	
Term	Yes	7 (20.6%)	27 (79.4%)	34 (100.0%)	0.007
	No	62 (45.9%)	73 (54.1%)	135 (100.0%)	
Prolonged	Yes	4 (50.0%)	4 (50.0%)	8 (100.0%)	0.589
	No	65 (40.4%)	96 (59.6%)	161 (100.0%)	

DISCUSSION

The mean age of the participants was 30.42 ± 5.616 years, mean BMI was 24.070 ± 2.704kg/m^2 and mean gestational age was 24.37 ± 4.844 weeks. 85 patients (50.3%) were aged more than 30 years. Participants with parity up to 3 were 94 (55.6%), and 126 patients (74.6%) were housewives. Preterm was the most common pregnancy outcome, recorded in 58 patients (34.3%), 34 patients (20.1%) had a term pregnancy and prolonged labour was least common (n=8, 4.7%). The cornerstone and crucial element in extending pregnancy is surgical treatment [10, 11]. The most popular technique for treating cervical insufficiency is cervical cerclage [12]. Prior research on ECC has primarily used previous research [12]. Those receiving treatment for ECC had a substantially greater length of gestation and a lower risk of preterm birth than those managed with bed rest [13, 14]. Comparable to the current investigation, a prior retrospective study assessed the efficacy of ECC and reported a comparable suture-to-delivery latency [15]. By lengthening the interval between identification and delivery, physical examinations that reveal ECC might raise the risk of spontaneous preterm birth, according to some earlier research [10, 16]. To assess the actual therapeutic impact of ECC in real life, a deeper examination of variables that anticipate favourable pregnancy outcomes is required. Educating women who get ECC requires knowledge of the risk markers associated with the condition, along with all individuals who ought to be properly informed of the potential risks associated with

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surgery. Warning signs for birth after 28 gestational weeks were identified in an earlier study of individuals with singleton pregnancies after ECC [16]. While ECC is linked to improved obstetric outcomes if the protruding coverings remain within the cervix, it has been linked to a lower chance of a birth lasting more than 28 gestational weeks if the protruding membranes stretch beyond the cervix. Optimal conception outcomes were linked to gestational ages of more than 22 weeks at ECC, while more serious pregnancy outcomes were linked to gestational ages of less than 22 weeks at ECC [17]. This falls in line with what we discovered. New research has indicated that emergency cervical cerclage is a good way to dilate the cervical cavity in the latter stages of the third trimester, which may result in an increasingly healthy baby [18-20]. The average duration of pregnancy extension increased significantly when Miller *et al.*, contrasted the impact of confinement with emergency cervical cerclage. Additionally, the cerclage group experienced considerably more births than the bed rest group ($p<0.05$). Research indicates that the emergency cervical cerclage group had a much higher live birth rate (72% vs. 25%) [21]. Additionally, Yang *et al.*, found that women who had emergency cervical cerclage performed after 20 weeks had significantly higher infant birth weights and longer gestation durations at birth [22]. According to Siqueira *et al.*, over eighty percent of women gave birth within 28 weeks, the median pregnancy age at birth was just under 26 weeks, and the mean cerclage-delivery gap was 20 days. Additionally, they proposed that an additional advantage of emergency cervical cerclage is the notable decrease in newborn complications [23]. According to Nutter *et al.*, women who undergo cerclage have a higher chance of giving birth prematurely in their pregnancy if their cervical dilatation is ≥2 cm at the time of the surgery [24].This might be due to women with protruding membranes tend to be more prone to illness, and since fetal membranes are exposed to vaginal germs more frequently. Furthermore, when the degree of cervical dilatation increases, the process becomes more difficult. According to reports, women who had cervical dilatation of at least 2 cm at the time of cerclage implantation were more inclined to obtain an intracervical Foley balloon catheter used for membrane clearance.

CONCLUSIONS

Preterm delivery was the most common pregnancy outcome after cervical cerclage in this cohort of patients. However, a reasonable number of patients were found with a term pregnancy, showing the adequate prolongation of pregnancy with cerclage in cervical insufficiency. Patients with a higher education level were more likely to achieve a term pregnancy compared to patients with lower education. Moreover, miscarriage was frequent in housewives compared to employed women.

Authors Contribution

Conceptualization: MB
Methodology: MB, UR, AS, S, SY
Formal analysis: UR, AS, SY
Writing review and editing: MB, AS, MH

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

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REFERENCES

[1] He D and Zhao D. Analysis of the Timing of Cervical Cerclage Treatment in Pregnant Women with Cervical Insufficiency and the Effect on Pregnancy Outcome. Emergency Medicine International.2022; 2022(1): 8340009. doi: 10.1155/2022/8340009.

[2] Zhou X, Li XX, Ge YM, Lai SY, Zhou LQ, Feng L *et al.* Effects of Vaginal Microbiota and Cervical Cerclage on Obstetric Outcomes of Twin Pregnancies with Cervical Incompetence: A Retrospective Study. Archives of Gynecology and Obstetrics.2022 Jan; 305(1): 77-86. doi: 10.1007/s00404-021-06119-2.

[3] Liu W, Lu Y, Fan Y, Hei G, Zhang A, Xue G *et al.* Role of Body Mass Index in Pregnancy Outcomes After Emergency Cerclage for Cervical Insufficiency in Singleton Pregnant Patients. BioMed Central Pregnancy and Childbirth. 2023 Sep; 23(1): 645. doi: 10.1186/s12884-023-05974-y.

[4] Wei Y and Wang S. Comparison of Emergency Cervical Cerclage and Expectant Treatment in Cervical Insufficiency in Singleton Pregnancy: A Meta-Analysis. PLOS ONE.2023 Feb; 18(2): e0278342. doi: 10.1371/journal.pone.0278342.

[5] Zhang Y, Zhao Z, Xu J, Wu F, Chen T, Hou S *et al.* Cervical Length of Preoperative Cervical Cerclage Prognostic Impacted the Effect of Cervical Insufficiency. BioMed Central Pregnancy and Childbirth.2025 Jan;25(1): 12. doi: 10.1186/s12884-025-07142-w.

[6] Joubert M, Sibiude J, Bounan S, Mandelbrot L. Mid-Trimester Miscarriage and Subsequent Pregnancy Outcomes: The Role of Cervical Insufficiency in a Cohort of 175 Cases. The Journal of Maternal-Fetal and Neonatal Medicine.2022 Dec; 35(24): 4698-703. doi: 10.1080/14767058.2020.1861600.

[7] Zhang Q, Liu Y, Xu C. Efficacy Analysis of Cervical Cerclage in the Treatment of Cervical Insufficiencies. Clinical and Experimental Obstetrics and Gynecology. 2023 Oct; 50(10): 207. doi: 10.31083/j.ceog5010207.

[8] Chan S and Dong X. Effectiveness of Prophylactic Transvaginal Cervical Cerclage in Improving Clinical Outcomes among Pregnant Women with Cervical Insufficiency: Meta-Analysis. Open Journal of Internal Medicine.2024 Apr; 14(2): 228-46. doi: 10.4236/ojim.2024.142021.

DOI: https://doi.org/10.54393/pjhs.v6i6.3071

[9] Prasad NN, Thampan SA, Nagarathnamma R. Emergency Cervical Cerclage and Pregnancy Outcomes. International Journal of Reproduction, Contraception, Obstetrics and Gynecology.2017 May;6(5):1993-8.doi:10.18203/2320-1770.ijrcog20171964.

[10] Pesegova SV, Timokhina EV, Strizhakov AN, Ignatko IV, Belousova VS, Anokhina VM. Prediction of Pregnancy Outcomes in Patients with Cervical Insufficiency Undergoing Cervical Cerclage. Obstetrics and Gynecology.2023 Oct; 18(10): 119-25. doi: 10.18565/aig.2023.159.

[11] Zhu J, Huang Y, Zeng H, Huang J, Zhang W. Pregnancy Outcomes of Twin Pregnancies with Cervical Insufficiency Undergoing Cervical Cerclage. Scientific Reports.2024 Nov; 14(1): 27414. doi: 10.1038/s41598-024-78662-2.

[12] Xiao H, Xing X, Zhang C, Shao Y. Association Between Clinical Subtypes and Pregnancy Outcome of Cervical Incompetence: A Retrospective Cohort Study. BioMed Central Pregnancy and Childbirth. 2025 Mar;25(1):348.doi:10.1186/s12884-025-07465-8.

[13] Tian S, Zhao S, Hu Y. Comparison of Laparoscopic Abdominal Cerclage and Transvaginal Cerclage for the Treatment of Cervical Insufficiency: A Retrospective Study. Archives of Gynecology and Obstetrics.2021 Apr; 303: 1017-23. doi: 10.1007/s00404-020-05893-9.

[14] Oriji PC, Briggs DC, Allagoa DO, Atemie G. Cervical Insufficiency and Perinatal Outcome in a Tertiary Hospital in Yenagoa, South-South, Nigeria. Asian Research Journal of Gynaecology and Obstetrics. 2021; 6(4): 5-13. doi: 10.9734/ajmah/2021/v19i930368.

[15] Lin ME and Li L. Clinical Efficacy and Prognostic Factors of McDonald Cervical Cerclage in Pregnant Women with Cervical Incompetence. Clinical and Experimental Obstetrics and Gynecology.2024 Nov; 51(11): 247. doi: 10.31083/j.ceog5111247.

[16] Hong S, Chung HS, Choi S, Jo YS. Prediction of Outcomes for Rescue Cerclage in Cervical Insufficiency: A Multicenter Retrospective Study. International Journal of Medical Sciences.2024Mar; 21(5): 896. doi: 10.7150/ijms.87941.

[17] Barinov SV, Artymuk NV, Novikova ON, Shamina IV, Tirskaya YI, Belinina AA *et al.* Analysis of Risk Factors and Predictors of Pregnancy Loss and Strategies for the Management of Cervical Insufficiency in Pregnant Women at A High Risk of Preterm Birth. The Journal of Maternal-Fetal and Neonatal Medicine. 2021Jul;34(13):2071-9.doi:10.1080/14767058.2019.1656195.

[18] Park KH, Lee KN, Choi BY, Lee MJ, Jeong DE. Rescue Cerclage in Women with Acute Cervical Insufficiency and Intra-Amniotic Inflammation: A Retrospective Cohort Study. Journal of Korean Medical Science. 2024 Nov; 39(42). doi: 10.3346/jkms.2024.39.e310.

[19] Gascón A, Maiz N, Brik M, Mendoza M, Del Barco E, Carreras E *et al.* Cervical Cerclage Vs Cervical Pessary in Women with Cervical Insufficiency: A Multicentric, Open-Label, Randomized, Controlled Pilot Trial [the CEPEIC trial]. European Journal of Obstetrics and Gynecology and Reproductive Biology .2024Dec;24:100347.doi:10.1016/j.eurox.2024.100347.

[20] Ni X, Lei S, Li S, Yang X, Li X, Gao Y *et al.* Efficacy of Late Cervical Cerclage for Preventing Preterm Birth in Pregnancies Complicated by Cervical Incompetence: Retrospective Cohort Study. BioMed Central Pregnancy and Childbirth.2025Mar;25(1): 310. doi: 10.1186/s12884-025-07432-3.

[21] Miller HE, Mayo JA, Reddy RA, Leonard SA, Lee HC, Suharwardy S *et al.* Racial and Ethnic Disparities in Cervical Insufficiency, Cervical Cerclage, and Preterm Birth. Journal of Women's Health.2025Jan; 34(1): 70-7. doi: 10.1089/jwh.2024.0088.

[22] Yang L and Yang H. Impact of Body Mass Index on Outcomes of Cervical Cerclage: A Systematic Review and Meta-Analysis. Obesity Facts.2024: 1-22. doi: 10.1159/000542543.

[23] Siqueira RM, Cavalcante AL, de Lucena AM, Cekannauskas JS, Melo CB, Basso G *et al.* Prospective Study on the Impact of Cervical Cerclage in Patients with Cervical Insufficiency: A Quantitative Analysis of Preterm Birth Rates and Gestational Complications. Caderno Pedagógico.2024Dec;21(13):e12117-.doi:10.54033/cadpedv21n13-261.

[24] Nutter A, Collazo M, Waller JA, DeYoung T, Ethirajan M, Barake C *et al.* Outcomes of History Indicated Cerclage Compared with Cervical Length Screening in Patients with Cervical Insufficiency. American Journal of Obstetrics & Gynecology.2023 Jan; 228(1): S92-3. doi: 10.1016/j.ajog.2022.11.198.