International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Hombardi P et al. Int J Reprod Contracept Obstet Gynecol. 2025 May;14(5):1591-1595
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20251246

Original Research Article

Comparision of pregnancy outcomes of history indicated and ultrasound indicated cervical cerclage: a prospective cohort study

Pooja Hombardi, Gayatri L. Patil, Tejaswi V. Pujar, Shama Anjum*

Department of Obstetrics and Gynaecology, SSIMS & RC, Davanagere, Karnataka, India

Received: 20 March 2025
Revised: 14 April 2025
Accepted: 15 April 2025

***Correspondence:**
Dr. Shama Anjum,
E-mail: shamaanjumhr@gmail.com

ABSTRACT

Background: Cervical cerclage is a widely used intervention to prevent preterm birth in women at risk for cervical insufficiency. Indications for cervical cerclage may arise from clinical history or clinical finding of cervical shortening and or dilatation or ultrasound guided cervical length measurements in pregnancy. Despite its widespread use, there is ongoing debate about which indication yields better pregnancy and neonatal outcomes.
Methods: Prospective cohort study included pregnant women who underwent cervical cerclage due to either history of preterm birth or findings from cervical ultrasound. Key outcomes such as gestational age at delivery, incidence of preterm birth, neonatal birth weight, NICU admissions, and APGAR scores were analyzed. Statistical methods included chi-square tests for categorical data and independent t-tests for continuous data, with a significance threshold set at $p<0.05$.
Results: The study found that both history-indicated and ultrasound-indicated cervical cerclage were effective in prolonging pregnancy and preventing preterm birth. In our study, history indicated cerclage resulted in lower rate of preterm births and better neonatal outcomes compared to ultrasound indicated cerclage. Although there were differences in gestational age at delivery and neonatal outcomes between the two groups, these differences were not always statistically significant.
Conclusions: This study suggests that both history-indicated and ultrasound-indicated transvaginal cervical cerclage as an effective clinical treatment for cervical insufficiency.

Keywords: Cervical insufficiency, Cerclage, Preterm birth, Prevention

INTRODUCTION

Preterm birth is a significant global problem complicating 10% of all pregnancies.[1] Causes of preterm are complex and multifactorial.[2] Cervical insufficiency occurring in 0.5–1% of pregnant women will need cervical cerclage to reduce preterm birth and its associated morbidity and mortality.[3] Cervical insufficiency arises from the woman's inability to support a full term pregnancy due a functional or structural defect of the cervix.[4] It is usually characterised by dilatation and shortening of the cervix before the 37th week of gestation in the absence of preterm labour and is classically associated with painless, progressive dilatation of the uterine cervix in the second or early third trimester resulting in membrane prolapsed, premature rupture of the membranes, mid-trimester pregnancy loss, or preterm birth.[5,6]

A history-indicated cerclage should be offered to women who have had three or more preterm deliveries and/or mid-trimester losses, previous operations on the cervix, old cervical tears are important. An ultrasound-indicated cerclage should be offered to women with a cervical length <25 mm if they have had one or more spontaneous preterm birth and/or mid-trimester loss.[7] In high-risk women who have not had a previous mid-trimester loss or preterm

birth, an ultrasound-indicated cerclage does not have a clear benefit in women with a short cervix.[8]

The preterm birth rate before 33 weeks of gestation was halved in women who had undergone cerclage (15% vs 32%).[9] The choice of cerclage material and specific technique of insertion was at the discretion of the surgeon.[10] There is currently insufficient evidence to support any particular technique. However, randomized comparisons of vaginal cerclage (Shirodkar versus McDonald) have shown similar outcomes.[11] Mc Donald's involves transvaginal purse-string suture placed at the cervical isthmus junction, as high as possible without bladder mobilization.[12] Abdominal cerclage can be performed preconceptually or laparoscopically, although there is no evidence to support a specific technique or timing. Regional or general anesthesia is required for cerclage insertion (including abdominal cerclage).[13] Routine catheterization is not required. If preterm birth has not occurred, removal is considered at 36–37 weeks in women anticipating a vaginal delivery.[14]

The risk of preterm delivery is inversely proportional to cervical length, 18% for <25 mm, 25% for <20 mm and 50% for <15 mm.[15] The presence of cervical funnelling is also an important finding. Greater than 50% funnelling before 25 weeks is associated with an 80% risk of preterm delivery.[16] Evidence-based medicine has validated transvaginal cervical cerclage as an effective clinical treatment for cervical insufficiency.[17]

Several different therapies have been advocated before or at the time of cerclage. These include tocolysis, antibiotics, and progestogens.[3] All these interventions lack high-quality prospective evidence of benefit and can be considered on an individual case basis. Multiple studies have compared different agents (progesterone, pessaries, and cerclage) to prevent preterm birth.[18] The role of combination therapies in the management of women at high risk of preterm delivery, specifically progesterone with cerclage needs further research.[19]

Hence present study is intended to evaluate and compare the pregnancy outcomes and fetal outcomes associated with two different types of cervical cerclage, history-indicated and ultrasound-indicated.

METHODS

This is a prospective cohort study conducted at S S Institute of Medical Sciences and Research centre, Davangere, involving 36 pregnant women who underwent cervical cerclage between 1st June 2022 and 31st June 2024. Ethical clearance was taken from the institutional ethics committee for the study. Inclusion criteria for the study were: singleton pregnancy, primigravida, multigravida, associated medical conditions like hypertension, gestational diabetes, hypothyroidism, In-Vitro Fertilization (IVF) conceptions, Mullerian anomalies were included. Women with multiple gestations, uncontrolled diabetes, heart disease, low lying placenta, previous failed cerclage, anomalous fetus, and chorioamnionitis were excluded.

Participants were divided into two groups: first- 18 pregnant women who underwent cervical cerclage due to poor prior obstetric history of 2 or more 2nd trimester pregnancy loss due to painless dilatation. The second group included 18 pregnant women who underwent cervical cerclage due to short cervical length (<2.5 mm) on TVS.

Once patient was admitted to the labour ward, demographic, clinical and ultrasound characteristics were noted. Basic investigations were done, informed consent taken. Patient underwent Mc Donald's cerclage procedure with 2-0 Mersilk suture material, under suitable anaesthesia. She stayed in the hospital for one day and then discharged. Follow up advice was antibiotics, antacids and oral tocolysis for 5 days. Follow up scheduled on outpatient basis. Warning signs informed to the patient.

With a non-random sampling approach, the available case files were reviewed. A direct comparison of study outcome measures between the two groups, including miscarriage rates, gestational age at birth, mode of delivery, incidence of preterm births, and neonatal health markers such as low birth weight and NICU admissions were analysed.

Statistical analysis

Descriptive statistics for demographic characteristics of participants were calculated. Proportions were calculated for key outcomes like preterm birth, miscarriages, low-birth weight, and NICU admissions. Chi-Square Test was used to compare the categorical outcomes like preterm births, low birthweight, NICU admissions etc between the two groups. Independent t-test or Mann-Whitney U Test will be used for Continuous Variables like mean gestational age between the two groups. A statistical significance was assumed at <0.05.

RESULTS

Out of the total 36 women included in the study, 18 were from the history-indicated group and the remaining 18 from ultrasound-indicated group, two miscarriages occurred- one in each group. The flow chart of outcomes is depicted in the Figure 1.

Gestational age

The mean gestational age in history-indicated group was 34 weeks and 6 days and 35 weeks and 2 days in the ultrasound-indicated group. Despite the higher rate of preterm births in the ultrasound-indicated group, their mean gestational age was slightly longer. Though the difference is relatively small, it was found to be statistically significant ($p<0.05$).

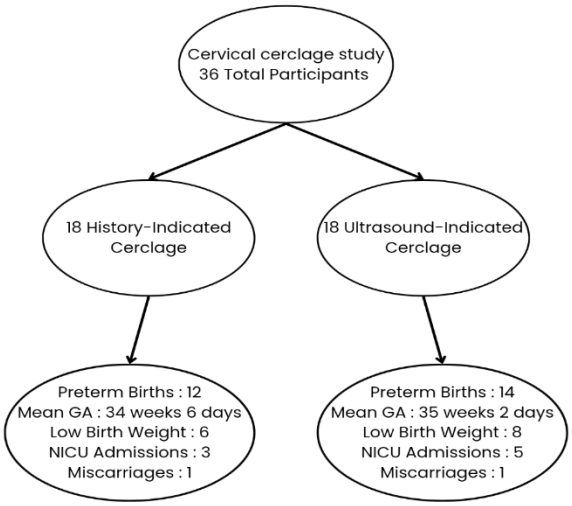

Figure 1: Study flow chart.

Table 1: Comparison of study variables (outcomes) among the two groups.

Variable	History indicated cerclage (n=18)	Ultrasound-indicated cerclage (n=18)	Total (n=36)	Comments/analysis
Mean gestational age (weeks)	34 weeks 6 days	35 weeks 2 days	N/A	Significant difference in gestational age between the two groups (p=0.045).
Preterm births (before 37 weeks)	12	14	26	No statistically significant difference in preterm birth rates (p=0.686).
Low birth weight (<2500g)	6	8	14	Low birth weight was comparable between groups (p=0.727).
NICU admissions	3	5	8	NICU admissions were similar across groups (p=0.686).
Miscarriages	1	1	2	One miscarriage occurred in each group.
APGAR scores (higher)	Better	Lower	N/A	History-indicated group had better APGAR scores.
Proportion of full-term births	29.40%	17.60%	23.50%	Full-term births were slightly more frequent in the history-indicated group.
Average neonatal ICU stay (days)	5 days	7 days	N/A	Ultrasound-indicated group had slightly longer NICU stays.
Postpartum complications	Minimal	Minimal	N/A	No significant postpartum complications reported in either group.
Rate of surgical complications	0%	0%	0%	No surgical complications occurred during cerclage procedures.

Preterm births

The pre-term birth rate was 70.6% (12/18) in history-indicated group and 82.4% in ultrasound-indicated group. Although both groups had high rates of preterm births, the ultrasound-indicated group had a slightly higher rate compared to the history-indicated group. However, this difference was not found to be statistically significant (p>0.05). This suggests that history indicated cerclage may be more effective in preventing preterm births.

Birth weight

The history-indicated group had 6 (35.3%) of low birth weight (LBW) babies and ultrasound-indicated group had 8 (47.1%) of low birth weight (LBW) babies. Though the low birth weight was more prevalent in the ultrasound-

indicated group compared to the history-indicated group, this difference was not found to be statistically significant (p>0.05).

NICU admissions

Three babies (17.6%) required NICU admission in the history-indicated group compared to 5 babies (29.4%) in the ultrasound-indicated group. NICU admissions were higher in the ultrasound-indicated group, which could suggest that this group had more severe complications or worse neonatal outcomes compared to the history-indicated group. However, this difference was not found to be statistically significant (p>0.05).

APGAR scores

Babies in the history-indicated group had better APGAR scores compared to those in the ultrasound-indicated group. This suggests that neonates in the history-indicated group generally had better immediate post-birth health conditions.

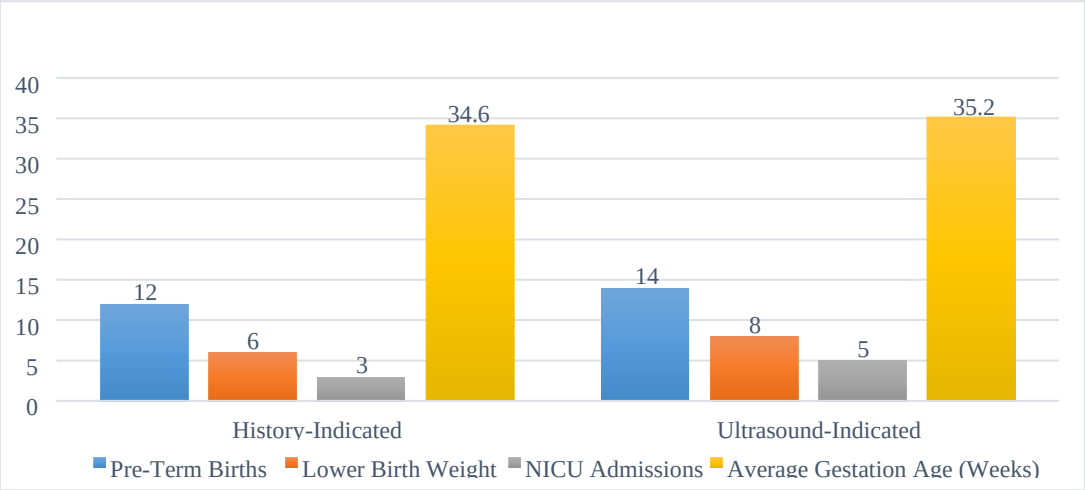

Figure 2: Comparison of metrics by indication type.

DISCUSSION

This study provides valuable insights into the outcomes of cervical cerclage in preventing preterm births, particularly when comparing history-based and ultrasound-based indications. The results indicate that while both methods are effective, the history-indicated cerclage seems to lead to better neonatal outcomes, particularly in terms of higher APGAR scores and fewer NICU admissions.

When comparing the two approaches, prior studies have shown mixed results. A study by Berghella et al, demonstrated that ultrasound-indicated cerclage, based on cervical length measurement, significantly reduces the risk of preterm birth in women with a shortened cervix.[20] However, our findings suggest that history-indicated cerclage, which takes into account previous adverse pregnancy outcomes, may offer a more comprehensive approach to managing cervical insufficiency.

In our study, history-indicated cerclage resulted in a lower rate of preterm births and fewer cases of low birth weight compared to ultrasound-indicated cerclage. This aligns with research by Owen et al, which found that using a history-based approach could identify women at higher risk for cervical insufficiency earlier, potentially leading to better outcomes.[21] The discrepancy between these findings and studies favoring ultrasound-based cerclage may be attributed to differences in patient populations and the timing of interventions.

The ultrasound-indicated group had a longer mean gestational age, but no statistically significant differences were observed in preterm birth rates, low birth weight, or NICU admissions between the two groups. History-indicated cerclage was associated with better APGAR scores. Overall, both methods of cerclage were found to be effective in preventing adverse pregnancy outcomes, with comparable safety profiles. This study highlights the clinical value of cervical cerclage while suggesting slight advantages in specific outcomes based on the indication for the procedure.

Additionally, the slightly longer gestational age observed in the ultrasound-indicated group contrasts with the lower neonatal complications seen in the history-indicated group, suggesting that while ultrasound-based cerclage may prolong pregnancy, it does not necessarily result in better neonatal health. This raises questions about the optimal criteria for cerclage placement and whether a more tailored approach, integrating both history and ultrasound findings, might yield the best outcomes.

CONCLUSION

Obstetric history appears to be a better predictor of the need for cerclage, as it allows for early identification and

intervention before significant cervical shortening occurs, thus improving the odds of carrying a pregnancy to a safer gestational age. In conclusion, this study recommends history-based cervical cerclage as the preferred approach for high-risk pregnancies.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Morton VH, Hobson PT, Mookes C, Middleton L, Daniels J, Simpson N, et al. Monofilament suture versus braided suture thread to improve pregnancy outcomes after vaginal cervical cerclage: a pragmatic randomised, controlled, phase III, superiority trial. The Lancet 2022;400:1426-36.
2. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. Lancet. 2008;371(9606):75-84.
3. Eleje GU, Eke AC, Ikechebelu JI, Ezebialu IU, Okam PC, Ilika CP. Cervical stitch (cerclage) in combination with other treatments for preventing spontaneous preterm birth in singleton pregnancies. Cochrane Database Syst Rev. 2020;9(9):CD012871.
4. ACOG Practice Bulletin No.142: Cerclage for the management of cervical insufficiency. Obstet Gynecol. 2014;123(2 Pt 1):372-379.
5. Brown R, Gagnon R, Delisle MF. No. 373-Cervical insufficiency and cervical cerclage. J ObstetGynaecol Can. 2019;41(2):233-47.
6. Society for Maternal-Fetal Medicine (SMFM). Temming L, Mikhail E., SMFM Publications Committee. Electronic address: pubs@smfm.org. Society for Maternal-Fetal Medicine Consult Series #65: Transabdominal cerclage. Am J Obstet Gynecol. 2023;228(6):B2-B10.
7. Bieber KB, Olson SM. Cervical Cerclage. [Updated 2023 Jul 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK560523/. Accessed 12 January 2025.
8. Shennan A, Story L, Jacobsson B, Grobman WA; the FIGO Working Group for Preterm Birth. FIGO good practice recommendations on cervical cerclage for prevention of preterm birth. Int J GynecolObstet. 2021;155:19-22.
9. Alfirevic Z, Stampalija T, Medley N. Cervical stitch (cerclage) for preventing preterm birth in singleton pregnancy. Cochrane Database Syst Rev. 2017;6(6):CD008991.
10. Berghella V, Szychowski JM, Owen J, Hankins G, Iams JD, Sheffield JS, et al. Suture type and ultrasound-indicated cerclage efficacy. J Matern Fetal Neonatal Med. 2012;25(11):2287-90.
11. McAuliffe L, Issah A, Diacci R, Williams KP, Aubin AM, Phung J, et al. McDonald versus Shirodkar cerclage technique in the prevention of preterm birth: A systematic review and meta-analysis. BJOG. 2023;130(7):702-12.
12. Song HS, Choo GY, Jin LH, Yoon SM, Lee T. Transvaginal cystocele repair by purse-string technique reinforced with three simple sutures: surgical technique and results. Int Neurourol J. 2012;16(3):144-8.
13. Tusheva OA, Cohen SL, McElrath TF, Einarsson JI. Laparoscopic placement of cervical cerclage. Rev Obstet Gynecol. 2012;5(3-4):e158-65.
14. Drakeley AJ, Roberts D, Alfirevic Z. Cervical stitch (cerclage) for preventing pregnancy loss in women. Cochrane Database Syst Rev. 2003;2003(1):CD003253.
15. Reicher L, Fouks Y, Yogev Y. Cervical Assessment for Predicting Preterm Birth-Cervical Length and Beyond. J Clin Med. 2021;10(4):627.
16. O'Hara S, Zelesco M, Sun Z. Cervical length for predicting preterm birth and a comparison of ultrasonic measurement techniques. Australas J Ultrasound Med. 2013 Aug;16(3):124-134. Erratum in: Australas J Ultrasound Med. 2013;16(4):210-211.
17. Harger JH. Cerclage and cervical insufficiency: an evidence-based analysis. Obstet Gynecol. 2002;100(6):1313-27. Erratum in: Obstet Gynecol. 2003;101(1):205.
18. Conde-Agudelo A, Romero R, Nicolaides K, Chaiworapongsa T, O'Brien JM, Cetingoz E, et al. Vaginal progesterone vs. cervical cerclage for the prevention of preterm birth in women with a sonographic short cervix, previous preterm birth, and singleton gestation: a systematic review and indirect comparison metaanalysis. Am J Obstet Gynecol. 2013;208(1):42.e1-42.e18.
19. Aubin AM, McAuliffe L, Williams K, Issah A, Diacci R, McAuliffe JE, et al. Combined vaginal progesterone and cervical cerclage in the prevention of preterm birth: a systematic review and meta-analysis. Am J Obstet Gynecol MFM. 2023;5(8):101024.
20. Berghella V, Odibo AO, To MS, Rust OA, Althuisius SM. Cerclage for short cervix on ultrasonography in women with singleton gestations: A meta-analysis. ObstetGynecol 2011;117(3):663-71.
21. Owen J, Hankins G, Iams JD, Berghella V, Sheffield JS, Perez-Delboy A, et al. Multicenter randomized trial of cerclage for preterm birth prevention in high-risk women with shortened midtrimester cervical length. Am J ObstetGynecol 2009;201(4):375.e1-375.e8.

Cite this article as: Hombardi P, Patil GL, Pujar TV, Anjum S. Comparision of pregnancy outcomes of history indicated and ultrasound indicated cervical cerclage: a prospective cohort study. Int J Reprod Contracept Obstet Gynecol 2025;14:1591-5.