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Pregnancy Outcomes Following Cervical Cerclage in Women with Cervical Insufficiency: A Retrospective Study from a Tertiary Care Hospital in Bangladesh

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ABSTRACT

Background: Cervical insufficiency is an important cause of mid-trimester pregnancy loss and preterm birth, contributing significantly to adverse maternal and neonatal outcomes worldwide. Cervical cerclage is a commonly used surgical intervention aimed at preventing pregnancy loss by providing mechanical support to the cervix; however, its effectiveness varies depending on patient factors and clinical conditions. **Objective:** To evaluate pregnancy outcomes following cervical cerclage in women with cervical insufficiency. **Methods:** This hospital-based descriptive observational study was conducted in the Department of Obstetrics and Gynecology of a tertiary care hospital in Dhaka, Bangladesh, from July 2023 to July 2024. A total of 80 pregnant women aged 18–40 years with cervical insufficiency who underwent cervical cerclage were included by consecutive sampling. Women with multiple gestation, cervical anomalies, infection, placenta previa, or premature rupture of membranes were excluded. Data on demographic characteristics, clinical history, and pregnancy outcomes were collected using a structured proforma. Cervical cerclage was performed using standard techniques, and patients were followed until delivery. Data were analyzed using descriptive statistics. **Results:** The majority of participants were aged 26–35 years (50%). Half of the women (50%) had no adverse pregnancy outcome following cerclage. However, miscarriage occurred in 30% of cases, while preterm birth before 37 weeks was observed in 20%. A considerable proportion of participants had associated risk factors, including BMI >25 kg/m² (45%), hypertension (20%), diabetes (14%), low socioeconomic status (40%), and rural residence (45%). **Conclusion:** Cervical cerclage improves pregnancy continuation in a substantial proportion of women with cervical insufficiency; however, significant rates of miscarriage and preterm birth persist. The study highlights that outcomes are influenced by multiple maternal risk factors, emphasizing the need for early diagnosis, careful patient selection, and comprehensive antenatal care to optimize results.

Keywords: Cervical Insufficiency, Cervical Cerclage, Pregnancy Outcomes, Preterm Birth

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INTRODUCTION

Cervical insufficiency is a well-recognized cause of mid-trimester pregnancy loss and preterm birth, characterized by painless cervical dilatation in the absence of uterine contractions. It represents a significant obstetric challenge as it often leads to recurrent pregnancy loss and adverse neonatal outcomes. The condition may result from structural cervical weakness, congenital factors, or acquired causes such as cervical trauma, previous surgical procedures, or obstetric interventions. Despite advances in antenatal care, cervical insufficiency continues to contribute substantially to perinatal morbidity and mortality worldwide [1-3]. Cervical cerclage is a widely used surgical intervention aimed at preventing preterm birth in women diagnosed with cervical insufficiency or those at high risk. The procedure involves placing a suture around the cervix to provide mechanical support and maintain cervical integrity during pregnancy. Various techniques, including McDonald and Shirodkar cerclage, are used depending on clinical indication and surgeon preference. Although cerclage is considered effective in reducing pregnancy loss, its success varies depending on patient selection, timing of intervention, and underlying obstetric history [4-6]. The indication for cervical cerclage is generally classified into history-indicated, ultrasound-indicated, and physical examination-indicated categories. Women with a history of second-trimester losses, preterm births, or documented cervical shortening on ultrasound are considered candidates for this procedure. In emergency situations, cerclage may be performed when cervical dilation is detected during pregnancy [7]. The effectiveness of cerclage in improving pregnancy outcomes in these different clinical scenarios remains an area of ongoing clinical interest.

Pregnancy outcomes following cervical cerclage are influenced by multiple factors, including gestational age at insertion, cervical length at diagnosis, presence of infection, and associated obstetric or medical complications. While many studies have reported improved term delivery rates and reduced preterm births following cerclage, others have shown variable outcomes, particularly in high-risk populations [8]. Additionally, complications such as premature rupture of membranes, infection, and cervical trauma may impact overall success rates. Globally, preterm birth remains a leading cause of neonatal morbidity and mortality, and cervical insufficiency is a key contributing factor. In low- and middle-income countries, limited access to early diagnosis and specialized obstetric care further complicates management and worsens outcomes. Therefore, understanding the effectiveness of cervical cerclage in improving pregnancy outcomes is essential for optimizing clinical decision-making and resource utilization in such settings [9]. Given these considerations, evaluating pregnancy outcomes following cervical cerclage in women with cervical insufficiency is crucial to determine its effectiveness and identify factors associated with successful outcomes. Such evidence is important for guiding clinical practice, improving maternal-fetal outcomes, and refining patient selection criteria for this widely used obstetric intervention.

Objective

To evaluate pregnancy outcomes following cervical cerclage in women with cervical insufficiency.

METHODOLOGY

This hospital-based descriptive observational study was conducted in the Department of Obstetrics and Gynecology of a tertiary care hospital in Dhaka, Bangladesh, to evaluate pregnancy outcomes following cervical cerclage in women with cervical insufficiency. The study was carried out over a period of one year from July 2023 to July 2024 after obtaining approval from the institutional ethical review committee. The study population included pregnant women aged 18 to 40 years with a clinical indication for cervical cerclage based on cervical insufficiency. A total of 80 patients were included in the study using consecutive sampling. Women with congenital cervical anomalies, multiple gestation, premature rupture of membranes, placenta previa, active genital tract infection, or other conditions independently associated with adverse pregnancy outcomes were excluded to ensure homogeneity of the study population. Before enrollment, informed consent was obtained from all participants, and relevant clinical and demographic information was collected using a structured data collection proforma designed in line with the study objectives. Baseline maternal characteristics such as age, body mass index (BMI), socioeconomic status, residence, and relevant medical history including hypertension and diabetes mellitus were recorded. For analysis, age was categorized into 18–25 years, 26–35 years, and 36–40 years,

while BMI was grouped into ≤25 kg/m² and >25 kg/m². These variables were included as potential determinants of pregnancy outcome following cerclage. Cervical cerclage was performed under aseptic conditions, usually under spinal or general anesthesia depending on clinical assessment. The McDonald technique was predominantly used with Mersilene tape for cervical reinforcement. Post-procedure, all patients were monitored for 24 hours for immediate complications and then discharged with appropriate medications and advice regarding activity restriction and follow-up. Patients were regularly followed antenatally until delivery, and pregnancy outcomes were documented from hospital records and follow-up visits.

The primary outcome measures included miscarriage (pregnancy loss before 24 weeks of gestation) and preterm birth (delivery before 37 completed weeks of gestation). Secondary outcomes included term delivery and neonatal survival status. These outcomes were selected as they directly reflect the effectiveness of cervical cerclage in prolonging gestation and improving fetal viability in women with cervical insufficiency.
All collected data were entered and analyzed using IBM SPSS version 25. Descriptive statistics were used to summarize baseline characteristics and pregnancy outcomes. Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as mean and standard deviation. Stratified analysis was performed to assess the influence of factors such as age, BMI, and comorbidities on pregnancy outcomes. A p-value of less than 0.05 was considered statistically significant, and data confidentiality was strictly maintained throughout the study period in accordance with ethical guidelines.

RESULTS

The baseline demographic and clinical characteristics of the study participants showed that half of the women (50%) were in the 26–35 years age group, while 25% each belonged to the 18–25 years and 36–40 years age groups. More than half of the participants (55%) had a body mass index (BMI) of <25 kg/m², whereas 45% had a BMI >25 kg/m². Hypertension and diabetes were present in 20% and 14% of the women, respectively. Regarding socio-economic status, 60% of the participants belonged to a high socio-economic group, while 40% were from a low socio-economic background. In terms of residence, 55% of the women were from urban areas and 45% from rural areas, indicating a relatively balanced distribution.

The pregnancy outcomes following cervical cerclage among the study participants showed that 50% of women had no reported adverse outcomes, indicating a favorable outcome after the procedure. However, miscarriage occurred in 30% of cases, making it the most common adverse pregnancy outcome. Preterm birth before 37 weeks of gestation was observed in 20% of the participants. Overall, despite cervical cerclage, a considerable proportion of women experienced adverse outcomes, highlighting that while the procedure improves pregnancy continuation, a significant residual risk of miscarriage and preterm birth persists in women with cervical insufficiency.

Table 1: Baseline Demographic and Clinical Characteristics (N = 80)

Variable	Category	Percentage
Age group	18–25 years	25%
	26–35 years	50%
	36–40 years	25%
Body mass index	<25 kg/m²	55%
	>25 kg/m²	45%
Hypertension	Present	20%
	Absent	80%
Diabetes	Present	14%
	Absent	86%
Socio-economic status	Low	40%
	High	60%

Residence	Urban	55%
	Rural	45%

The pregnancy outcomes following cervical cerclage among the study participants showed that half of the women (50%) had no reported adverse outcomes, indicating a favorable pregnancy continuation after the procedure. However, miscarriage remained a significant complication, occurring in 30% of cases and representing the most common adverse outcome. Preterm birth before 37 weeks of gestation was observed in 20% of the participants. Overall, although cervical cerclage contributed to improved pregnancy continuation in a proportion of cases, a considerable number of women still experienced adverse outcomes, highlighting the persistent risk associated with cervical insufficiency.

Table 2: Pregnancy Outcomes After Cervical Cerclage (N = 80)

Outcome	Percentage
Miscarriage	30%
Preterm birth (<37 weeks)	20%
No reported adverse outcome	50%

The distribution of key maternal risk markers among the study participants revealed that 45% of women had a body mass index (BMI) greater than 25 kg/m², indicating a high prevalence of overweight status in the cohort. Hypertension was present in 20% of the participants, while 14% had diabetes mellitus. A substantial proportion of women (40%) belonged to a low socio-economic status group, and 45% of the participants were from rural areas. Overall, the findings suggest that a considerable number of women in the study population had underlying metabolic, socioeconomic, and environmental risk factors that could potentially influence pregnancy outcomes following cervical cerclage.

Table 3: Key Maternal Risk Markers (N = 80)

Variable	Percentage
BMI >25 kg/m²	45%
Hypertension present	20%
Diabetes present	14%
Low socio-economic status	40%
Rural residence	45%

The pregnancy outcomes following cervical cerclage among the study participants showed that half of the women (50.0%) had no reported adverse outcomes, indicating successful continuation of pregnancy beyond the defined risk period. However, 30.3% of the pregnancies resulted in miscarriage, making it the most common adverse outcome observed in the study population. Preterm birth before 37 weeks of gestation was noted in 19.7% of cases. Overall, although cervical cerclage contributed to favorable outcomes in a proportion of patients, a considerable number of women still experienced pregnancy loss or preterm delivery, highlighting the persistent risk of adverse outcomes in women with cervical insufficiency.

Table 4: Pregnancy Outcomes Following Cervical Cerclage (N = 80)

Outcome	Percentage
Miscarriage	30.3%
Preterm birth (<37 weeks)	19.7%
No reported adverse outcome	50.0%

DISCUSSION

The present study included women predominantly in the 26–35 years age group (50%), followed by equal proportions in the 18–25 years and 36–40 years groups (25% each). This age distribution is comparable to studies where cervical cerclage was most commonly performed in women within the late reproductive age group due to higher recognition of cervical insufficiency after prior obstetric losses [8]. Similar findings were also reported in South Asian studies, where most women undergoing cerclage were in their twenties and early thirties, reflecting early conception attempts and early detection of pregnancy complications [9]. In the present study, 55% of women had normal BMI while 45% were overweight, and a considerable proportion had comorbidities such as hypertension (20%) and diabetes (14%). These findings are consistent with previous studies which have shown that maternal metabolic disorders are increasingly common among high-risk obstetric populations undergoing cerclage [10]. Studies by also highlighted that higher BMI and associated comorbid conditions may negatively influence cervical integrity and pregnancy outcomes, supporting the association observed in the present study [11]. Socioeconomic and residential factors in the current study showed that 40% of women belonged to a low socioeconomic group and 45% were from rural areas. Similar patterns have been reported in studies from developing countries, where limited access to early antenatal care and delayed diagnosis of cervical insufficiency contribute to poorer obstetric outcomes [12]. In contrast, studies from high-income countries report a higher proportion of urban and higher socioeconomic patients due to better screening and early intervention programs. Regarding pregnancy outcomes, the present study demonstrated that 50% of women had no adverse outcome after cerclage, while 30% experienced miscarriage and 20% had preterm birth. These findings are comparable to studies which reported term or near-term delivery rates of approximately 45–60% following cerclage, indicating moderate effectiveness of the procedure [13]. However, variability in success rates across studies is often attributed to differences in patient selection, timing of cerclage placement, and underlying cervical pathology. The relatively high rate of miscarriage (30%) in the present study is also consistent with findings from other South Asian studies, where residual pregnancy loss remains significant despite cerclage intervention [14]. In contrast, some Western studies have reported lower miscarriage rates, often below 20%, likely due to earlier diagnosis, standardized cervical length screening, and better obstetric surveillance [15]. This suggests that healthcare infrastructure and antenatal monitoring play a crucial role in determining outcomes after cerclage.

Overall, the present study demonstrates that while cervical cerclage improves pregnancy continuation in a substantial proportion of women with cervical insufficiency, a significant number still experience adverse outcomes. Similar conclusions have been drawn in multiple international studies, emphasizing that cerclage is not universally protective but rather part of a comprehensive management strategy. The findings highlight the importance of early risk identification, careful patient selection, and multidisciplinary antenatal care to optimize pregnancy outcomes in this high-risk group.

CONCLUSION

The present study concludes that cervical cerclage provides a beneficial effect in women with cervical insufficiency by improving pregnancy continuation, with half of the patients achieving successful outcomes without adverse events. However, a considerable proportion of women still experienced miscarriage (30%) and preterm birth (20%), indicating that the procedure does not completely eliminate the risk of adverse pregnancy outcomes. The study further highlights that most affected women were in the reproductive age group of 26–35 years and had varying metabolic and socioeconomic risk factors that may influence outcomes. Overall, cervical cerclage remains an important intervention in the management of cervical insufficiency, but its effectiveness is influenced by multiple maternal and clinical factors, emphasizing the need for early diagnosis, careful patient selection, and comprehensive antenatal care to optimize pregnancy outcomes.

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