Original Article

CERVICAL INCOMPETENCE: PREVALENCE, SOCIO – DEMOGRAPHIC AND CLINICAL CHARACTERISTICS IN RIVERS STATE UNIVERSITY TEACHING HOSPITAL, PORT HARCOURT, SOUTH-SOUTH NIGERIA.

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Abstract

Background: The Continuation of pregnancy to period of foetal viability and/or term is highly affected by incompetent cervix. Cervical incompetence is the inability of the cervix to carry pregnancy to term due to structural or functional defect. The global prevalence of cervical incompetence ranges from 2.7-18.4/1000 births. Cervical cerclage is widely used in its management. There is paucity of literature on the prevalence and treatment option in our environment. Thus, the aim of this study is to determine the prevalence, socio-demographic, and clinical characteristics of cervical incompetence and its treatment in women of reproductive age attending RSUTH for care.

Aim: To determine the prevalence, socio-demographic and clinical characteristics of cervical incompetence and itstreatment.

Materials and Methods: It was a retrospective observational study in which data were extracted from the case files of the 96 patients diagnosed with cervical incompetence using structured study proforma. Data were sorted, coded and analysed using Statistical Package for Social Sciences (SPSS) version 25.

Result: The prevalence of cervical incompetence in Rivers State University Teaching Hospital is 0.69% or 6.9 per 1000 deliveries. The mean age of the patients was 32.4 SD 3.7, and majority (53.1%) were nulliparous. Most of the patients 47 (49%) had secondary level of education. There were 87 (90.6%) elective and 9 (9.4%) emergency cases of cerclage insertion. The commonest type of anaesthesia used was regional (subarachnoid block) 89 (92.7%). All the patients had MacDonald procedure with mersilene tape. The mean gestational age and duration of cerclage insertion was 15.2 weeks (95% CI, 14.8 to 15.6) and 15.1 minutes (95% CI, 13.1 to 17.1) respectively.

Conclusion: Cervical incompetence is not uncommon in our region. Cervical cerclage placement is beneficial in managing cervical incompetence. The duration of the procedure is short with minimal blood loss.

Keywords: Cervical incompetence, cervical cerclage, Prevalence, RSUTH, South –South.

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INTRODUCTION

Cervical incompetence or insufficiency is defined as the inability of the cervix to carry pregnancy to term due to structural or functional defect.[1,2] Cervical incompetence is a major cause of mid-trimester pregnancy losses and preterm deliveries.[1,3,4,5] Studies have shown that 0.5 – 1.8% of all pregnancies and 8 – 15% of all recurrent pregnancy losses are complicated by cervical incompetence.[6] Patient with cervical incompetence often presents with the pre-viable loss of pregnancy due to dilatation of cervix in the absence of any increase in the baseline uterine activity or associated with presence of minimal uterine activity[2].

In any case of cervical incompetence where there is uterine activity, the observed cervical dilation is usually out of proportion to the degree of such uterine contraction. It was in 1958 that the first reference of the cervix was made as a cause of pregnancy loss [2]. Hundreds of years later, lash and lash described 'the cervical internal os incompetence with a surgical repair procedure.'[2]Despite lack of uniformity in the diagnosis and definition of cervical incompetence, the incidence of cervical incompetence has been reported as 2.7-18.4 per 1000 births.[4]Bothprimigravidae and multigravidas are at risk of incompetence cervix.

The causes of cervical incompetence may be classified into congenital, acquired and idiopathic. The congenital causes include uterine anomalies such septate uterus, bicornuate uterus, uterine didelphys, other Mulleriandefects; short cervix, non-fibrous soft cervical tissue, abnormal lower uterine segment, short cervical canal associated with in utero exposure to diethylstilbestrol (DES).[2,3] Additionally, changes in the content of cervical collagen and elastin have been linked to cervical incompetence.[7, 8]The acquired causes are: vaginal deliveries, gynaecological procedures, forceful dilation of cervix during termination of pregnancy, bacterial mediated activity, cervical amputation, and cone biopsy.

Cerclage procedures prophylactic, elective and/ or emergency during pregnancy are the standard surgical treatment option for cases of cervical incompetence.[2,7,8] The Most commonly used cerclage procedures are the MacDonald[9] and Shirodkar[10]. Other reported procedures are Wurms procedure, Lash and Lash, Mann cerclage, Emmet and page technique which are performed in non-pregnant state.[3,11,12] There is paucity of literature on the prevalence of cervical incompetence and its management in our environment. There is also no study on cervical incompetence, and its management in our hospital.

This study aims to determine the prevalence, socio-demographic and clinical characteristics of cervical incompetence and its treatment in RSUTH with the view to enhancing obstetric practice in this area. The objectives of the study are to determine the rate of cervical incompetence in our hospital, the commonest method of treatment, mean gestational age at insertion and mean duration of the treatment procedure.

MATERIALS AND METHODS

This was a retrospective cross-sectional study. The records/case notes of all the patients that presented to Rivers State University Teaching Hospital with history suggestive of cervical incompetence over a five-year period (from 1st January 2014 to 31st December, 2018) were retrieved; data extracted using a structured study proforma. Diagnosis of cervical incompetence was clinical based on history of painless dilatation of the cervix, mid-trimester pregnancy losses, recurrent pregnancy losses and/or ultrasound scan diagnosis of short cervical length of less than 25mm with or without funnelling of the internal cervical Os.

DATAANALYSIS

The data were sorted, analysed using the Statistical Package for Social Sciences (SPSS) version 25. Results were presented in tables and charts. Categorical variables were summarized using frequency and percentages while continuous variables in mean with standard deviation and confidence interval round the mean where necessary.

RESULTS

Over the period reviewed, there were 13,840 deliveries and 96 cases of cervical cerclage procedures for cervical incompetence were diagnosed and managed. Thus, the rate of cervical incompetence in RSUTH is 0.69% or 6.9 per 1000 deliveries. The mean age of the patients was 32.4 SD 3.7.

Table 1 illustrates the socio-demographic characteristics of the patients. From Table 1, the modal age group is 30-34 years (55.2%). The mean gestational age in weeks at cerclage insertion was 15.2 SD 2.1. The modal parity was Para 0 which accounted for about 53.1% of cases. The inability

of the cervix to retain pregnancy up to period of foetal viability explains the highest percentage of nulliparas presenting with this condition.

Majority of the patients 70 (73%) had at least primary education while 26 (27%) had tertiary education. The religion of most of the patients 94 (97.4%) was Christianity, while 2 (2.1%) Islam.

Table 1: Maternal socio-demographic characteristics

Variable	Frequency (n=96)	Percentage (100%)
Age		
20-24	3	3.1
25-29	14	14.6
30-34	53	55.2
35-39	23	24.0
≥40	3	3.1
Mean age (SD) 32.4 (3.7)		
Parity		
0	51	53.1
1	23	24.0
2	13	13.5
3	5	5.2
4	3	3.1
≥5	1	1.0
Educational Status		
Primary	23	24
Secondary	47	49
Tertiary	26	27
Religion		
Christianity	94	97.9
Islam	2	2.1

Table 2; shows the procedure variables and type of anaesthesia used. The mean duration of insertion of cerclage is 15.1 minutes, 95% CI (13.1 to 17.1). The mean gestational age of the patients was 15.2 95% CI (14.8 to 15.6). Thirty-four (35.4%) patients had their cerclage inserted at 14 weeks, 31 (32.3) at 15 weeks, 15 (15.6%), 5(5.2%) at 16 and 17 weeks respectively. The cerclage procedures done at 18 week or more were all emergency cerclage insertion. Mersilene suture or tape was the only suture material used during cerclage procedure for all the patients. Of the type of anaesthesia used for the cerclage procedure, 89 (92.7) was regional (spinal or subarachnoid block) and 7 (7.3%) was general anaesthesia (Total Intravenous Anaesthesia) (Table 2).

Table 2: Procedure variables and type of anaesthesia used

Variable	Mean	SD	95% CI *
Duration of procedure (in minutes)	15.1	9.9	13.1 to 17.1
Gestational age at insertion (in weeks)	15.2	2.1	14.8 to 15.6
	Frequency	**Percentage (100%)**	
Gestational age at insertion			
9	1	1.0	
13	4	4.2	
14	34	35.4	
15	31	32.3	
16	15	15.6	
17	5	5.2	
≥18	6	6.3	
Type of suture used			
Mersilene	96	100	
Others#	0	0	
Type of Anaesthesia	89	92.7	
Regional (spinal)	7	7.3	
General (TIVA)			

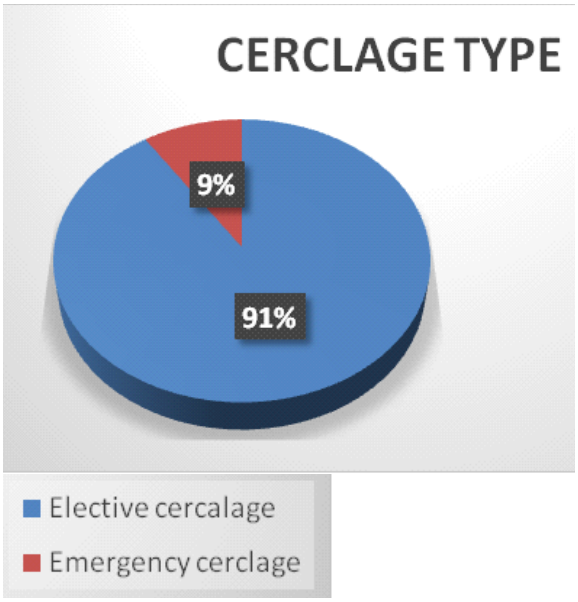

Figure 1: Pie chart showing the different cerclage type.

Majority [87 (91%)] of the cerclage procedure were done as elective cases while 9 % were done as emergency (Figure1). Fifty-seven patients (59.4%) patients with confirmed ultrasound diagnosis of short cervical length in addition to at least one abortive or miscarriage event, 26 (27%) presented with recurrent miscarriages, 7 (7.3%) had history of previous abortions and 6 (6.3%) had history of previous cerclage placement (Figure 2).

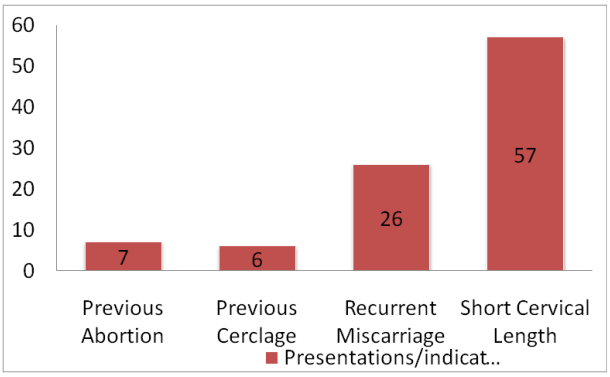

Figure 2: Bar chart showing the distribution of the clinical presentation/indications

DISCUSSION

In obstetric practice, continuation of pregnancy to period of foetal viability is highly affected by incompetent cervix.[12] Both nulliparas and multiparas are at risk of cervical incompetence. Cervical incompetence is a major cause of preterm delivery and recurrent mid trimester pregnancy losses.[3,4,5,13] It is associated with 20-30% of second trimester miscarriages and 10 % of preterm deliveries[1]. Cervical function abnormalities may be a major contributor to the mechanical and biochemical events that culminate in preterm delivery.[12] The prevalence of cervical incompetence in RSUTH is 0.69 % or 6.9 per 1000 births. This falls within the reported global occurrence rate of as 2.7-18.4 per 1000 births[2] and similar to the findings of incompetence rate of 7 per 1000 births in University of Benin Teaching Hospital.[14]

A study conducted at the University of Port Harcourt Teaching Hospital reported an incidence rate of 0.17%.[15] The wide variation in prevalence rates is due to lack of uniformity in the definition and diagnosis of incompetent cervix across studies. Although the aetiology of this condition in some cases is not fully known, congenital and acquired causes have been implicated. The congenital causes include uterine anomalies such septate uterus, bicornuate uterus, uterine didelphys, other Mulleriandefects; short cervix, non-fibrous soft cervical tissue, abnormal lower uterine segment, short cervical canal associated with uterine exposure to diethylstilbestrol (DES)[2]. Additionally, changes in the content of cervical collagen and elastin have been linked to cervical incompetence.[2,4,5] The acquired causes are: vaginal deliveries, gynaecological procedures, forceful dilation of cervix during termination of pregnancy, bacterial mediated activity, cervical amputation, and cone biopsy.[1-3]

The mean duration of cerclage insertion is 15.1 (95% CI, 13.3 to 15.4) minutes, range 4- 56 minutes. This means that the true population 'mean' duration of insertion lies between 13.3 and 15.4 minutes. In any case, the duration of cerclage insertion is short, less than or equal to 15.4 minutes. Cerclage insertion can be done under regional or general anaesthesia. In this study most of the procedures 87 (91%) were done under regional anaesthesia (subarachnoid block) compared to general 9%. The use of regional anaesthesia unlike general anaesthesia has the advantage of not causing retching and coughs which may put undue strain on the cerclage.[1]

MacDonald technique was the only method of treatment used for all the patients. It is the preferred method especially in West African sub-region.[1,2] MacDonald technique has the following advantages: minimal blood loss, less formation of cervical scar and less chances of cervical dystocia in labour, it is easy to perform compared to other methods like Shirodkar. Thesecould account for its preference to other methods in most centres including ours.

The gestational age at insertion of cervical cerclage from this study range from 9-24 weeks, and the mean age was 15.2 weeks' gestation. This is similar to the findings of Okusanya and Isabu.[14] However, it is lower than that of Parilla et al who found an overall mean gestational age of 18.6 ±4.5 weeks;[6] and in contrast to the findings from a study done in Kenya[16] and another by Awarts etal.[17] Although Awarts et al studied 34 cases of emergency cerclage placement after 20 weeks of gestation, they reported a mean duration of pregnancy of 22.1 weeks at cerclage insertion. The timing of cerclage insertion was an estimate for the timing of cervical incompetence given its natural history.

According to Parilla et al, the exact time of cerclage insertion would be possible by studying prospectively a cohort of women with incompetence by frequent clinical and ultrasound examination throughout pregnancy.[6]Placement of cerclage in second trimester was ideal to allow for exclusion of miscarriages due to chromosomal anomalies which is the most common cause of pregnancy loss in the first trimester. From our study the gestational age group added14-17 weeks' gestation at insertion of cerclage had highest presentation. This is similar to the findings from the studies by Sechler et al[18] and Feyi et al,[19] and at this gestational the increased filling of amniotic sac and its content contributes to progressive dilatation of the cervix.[5,18,19,20] For the above reasons, we strongly suggest insertion of cervical cerclage after first trimester of pregnancy (at about 14-16 weeks), prophylactic cerclage in particular. However, insertion can be done in late first trimester and above 16 weeks where it is indicated. In such cases, good clinical experience and judgement is of essence.

In this study, we observed that cerclage insertions done from 18 or more weeks were all emergency cases. We had a total of 9 cases (9.4%) of emergency or rescue cerclage insertion. Emergency cerclage may be inserted when a woman presents with silent or painless cervical dilatation and bulging of foetal membranes without uterine contraction.[12] This was the case of our patients that had emergency cerclage insertion over the period under review. Cerclage has been reported to improve birth weight, and not associated with perinatal mortality or maternal morbidity, increased in frequency of chorioaminitis.[12] However, cerclage should not be inserted where there is clinical evidence of uterine contraction, bleeding, intrauterine foetal death, rupture of foetal membranes and infection, including raised C-reactive protein (CRP) or elevated white blood cell count.[1-3]

From our study the mean age of patients was 32.4 SD 2.1 (53.1%) with the majority of them being nulliparous. This is similar to the findings in other studies.[5,18] A study conducted at the University of Benin Teaching Hospital found a mean maternal age of 33.3 ± 3.9. Majority (53.1%) of our patients were nulliparous and 23% multiparous contrary to the finding of Osemwenkha and Osaikhuwuomwan who had more cases of occurrence in multiparous women (68.3%).[18]

Patients with cervical incompetence often present with pre-viable pregnancy losses in decreasing order of gestation. The history of previous spontaneous or recurrent miscarriages and short cervical length remains valid in the diagnosis of cervical incompetence, as was observed from this study where fifty-seven (59.4%) had a previous

history of spontaneous miscarriages and ultrasound scan diagnosis of short cervical length. More so, cerclage insertion was indicated in twenty-six (27.9%) patients who had a previous history of recurrent miscarriages over the period of review. Furthermore, while 34.4 % of the patients had at least one abortion or miscarriage event, 6 (6.3%) had a history of previous cerclage insertion. For this study ultrasound scan cervical length of < 25mm was used as the cut-off for making the diagnosis of incompetence in addition to clinical features suggestive of cervical incompetence.

While current evidence reveals that cervical is not beneficial in women whose only risk of preterm delivery is a short cervix in late second trimester, there is good evidence that women with history of spontaneous second trimester loss or preterm birth who have short cervical length will benefit from ultrasound scan indicated cerclage insertion.[12] Studies have shown that history is key in the diagnosis of cervical incompetence.[20-24] Preterm delivery is a major determinant of increased perinatal morbidity and mortality.[20]Studies have shown that preterm births accounts for about 70% of all perinatal mortality.[24,25,26] As such the use of cervical cerclage to prolong the pregnancy to term seems to enhance improved perinatal outcome.[27] A meta-analysis of studies on the use of cervical cerclage for preventing pregnancy loss in women done by Drakeley et al. revealed a significant reduction in pregnancy loss and preterm delivery rates, despite his conclusion that effectiveness of

cerclage is not proven.[28] On the contrary, a survey done in South African revealed no evidence of prolongation of pregnancy or improved survival with cerclage.[29] Cervical cerclage has become an established treatment for cervical incompetence despite the controversies on its effectiveness and inconsistencies in the diagnosis of incompetent cervix.[12,27]

CONCLUSION

Cervical incompetence or insufficiency is not uncommon in our region. The history of previous spontaneous and/or recurrent miscarriages and short cervical length remains valid in the diagnosis of cervical incompetence. Cervical cerclage placement is beneficial especially in properly selected cases, and remains the definitive mode of treating cervical incompetence. The duration of the procedure is short with minimal blood loss.

LIMITATION

This was a hospital-based study. The results may not reflect the findings in other tertiary institutions in Nigeria or the West African sub-region.

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CONFLIT OF INTEREST

The authors declare that there are no conflicts of interest.

CONSENT

Written informed consent was obtained from every patient that participated in the research.

ETHICAL APPROVAL

The research work was examined and approved by the hospital research and ethics committee.

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