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ORIGINAL ARTICLE

Survey: the management of pregnant women with a history of excisional treatment of the uterine cervix for cervical intra-epithelial neoplasia

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Abstract The purpose of this study is to gauge the management of pregnant women with a past history of cervical excisional treatments for cervical intra-epithelial neoplasia (CIN). A postal survey of 120 consultant obstetricians and gynaecologists in the northwest of England was done. The response rate was 41.7%. Thirty-seven respondents (74%) agreed with the evidence that cervical excisional treatment increases the risk of late miscarriage, preterm labour, premature rupture of the membranes and spontaneous rupture of the membranes at term. Thirty-one (62%) think that cervical assessment during pregnancy in women who had excisional treatments is not essential, nevertheless, 72% of the respondents utilise transvaginal ultrasonography alone or in combination with other methods to assess the cervix in these women. Seventeen (34%) assess the cervix monthly and nineteen (38%) carry out variable assessments ranging between once in the first trimester and every 6–8 weeks. Thirty-one (62%) offer cervical cerclage and 28 (56%) will offer it between 13–16 weeks gestation. Twenty-four (48%) would offer preconception transabdominal cervical cerclage to at-risk women. Forty (80%) do not believe that previous excisional treatment will alter the vaginal flora and only eight (16%) perform high vaginal swabs. There is a lack of consensus and consistency in the cervical assessment for the prediction of the risk of preterm birth in women who had cervical excisional treatments for CIN. Transvaginal ultrasonography alone or in combination with other methods is the most favoured technique in cervical assessment. The majority of the respondents offer cervical cerclage. In the presence of evidence that cervical excisional treatment for CIN carries a real risk of pregnancy loss and morbidity, there is a need for an agreed and standardised strategy in cervical assessment and intervention techniques.

Keywords Cervical excisional treatments · Uterine cervix · Cervical intra-epithelial neoplasia · LLETZ · Cone biopsy · Late miscarriage · Preterm labour · Cervical cerclage

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Introduction

Excisional treatments of the uterine cervix for cervical intra-epithelial neoplasia (CIN) such as cervical cone biopsy, cervical laser conisation (CLC) and loop electrosurgical excision procedure (LEEP) may increase the risk of preterm delivery, low birth weight and pre-labour preterm rupture of the membranes (PPROM) in subsequent pregnancies [1–7]. A met-analysis in 2006 [8] showed that all the cervical excisional procedures to treat CIN have similar pregnancy-related morbidities.

The depth and volume of the tissues excised correlate with the outcomes in subsequent pregnancies and a cone height of at least 10 mm has been recognised as an independent risk factor for the duration of pregnancy and for the occurrence of preterm delivery in subsequent pregnancy [9] and a relatively large LEEP significantly increases risk of low birth weight and preterm birth [10].

Excisional procedures to treat CIN such as large loop excision of the transformation zone (LLETZ), LEEP, CLC and cold knife cone in young women are increasing with no evident adverse effects on fertility [8]; consequently, the number of pregnant women who had these treatments is expected to rise. There is no consensus among obstetricians

and gynaecologists as to how to manage these at-risk women when they become pregnant and it would seem beneficial to gauge the current practices in order to inform future management.

Methods

This is a postal survey (see Appendix 1) to 120 consultant obstetricians and gynaecologists working in the North West of England, UK. All but one respondent, a gynaecological oncologist, are practicing general obstetrics and gynaecology. The posted survey included a stamped-return envelope.

Results

All the results pertain to women with excisional treatment to the uterine cervix. The response rate is 41.7% (50/120). Thirty-seven respondents (74%) agree with the evidence that cervical excisional treatment (LLETZ, Laser cone, cold knife cone and LEEP) to the cervix for CIN increases the risk of late miscarriage, preterm labour, premature rupture of the membranes (PROM) and spontaneous rupture of the membranes (SROM). One (2%) did not answer and 12 (24%) disagree. Eight out of 50 (16%) will assess the cervix by ultrasonography, six out of 50 (12%) would offer cervical cerclage to women with previous pregnancy loss, PROM or SROM, or with cervical length of less than 2 cm and six out of 50(12%) would offer preconception transabdominal cervical cerclage to high-risk women who had excisional treatment, repeated treatments, second trimester loss, history of preterm labour or PROM.

Table 1 in Appendix 2 illustrates the respondents' views about cervical assessment during pregnancy. Twenty (40%) did not comment on their current practices; among them are 16 of the 18 (88.9%) who thought cervical assessment is essential. The practices of 29 (58%) are illustrated in Table 2 and 3 in Appendix 2. Table 3 outlines the conditions for cervical assessment by 14 respondents.

Charts 1 and 2 in Appendix 3 illustrate the methods and frequency of cervical assessment, respectively. Twenty out of the 31 (64.5%) who thought assessment is not essential do assess the cervix. Thirty-one respondents (62%) offer cervical cerclage, 17 (34%) do not and two (4%) did not comment.

Tables 4 and 5 in Appendix 2 show the indications and timing of cervical cerclage, respectively. Twenty-four (48%) would offer preconception transabdominal cervical cerclage to high-risk women, 23 (46%) would not and three (6%) did not comment. Seven (14%) think that previous excisional treatment will alter the vaginal flora, 40 (80%) disagree and three (6%) did not comment. Eight (16%) perform high vaginal swabs (HVS), see Table 6 in Appendix 2.

Discussion

The physiological and anatomical roles of the uterine cervix in the support and protection of intra-uterine pregnancy are fundamental. Any trauma to the cervix from cervical excisional procedures such as cervical cold knife cone biopsy, CLC, loop electrosurgical excision procedure (LEEP) and large loop excision of the transformation zone (LLETZ) has the potential of affecting the integrity of this vital organ. The standard excisional treatment of the cervix to treat CIN in our hospital and in other hospitals in the North West region of England is LLETZ and, occasionally, cold knife biopsy. A probable sequel of the removal of cervical connective tissue is shortening, scarring and loss of plasticity resulting in decreased tensile strength of the cervix, increased vulnerability of the membranes to shearing forces, loss of protection from cervical mucus-secreting glands and increased risk of ascending infection. All these factors will, theoretically, increase the woman's susceptibility to preterm labour, PPROM, PROM and SROM. A shorter time interval between treatment and conception may increase the risk of preterm birth [11]. On the other hand, CIN, regardless of treatment, could lead to increased preterm birth [12] and women with CIN are more likely to be cigarette smokers—a well documented association with preterm labour.

Twenty-six per cent of the respondents disagree with the evidence from retrospective observational data that cervical excisional procedures carry similar pregnancy-related morbidity [1–8]. This could be a reflection of the uncertainty induced by earlier studies, which were unclear about the effect of these treatments on pregnancy outcome and subsequent risk of preterm delivery [13–16] or could be reservations regarding the design of some of the earlier studies [6]. Thirty-six per cent of the respondents would routinely perform cervical assessment on women with excisional treatment of cervix, and 14 respondents outlined the conditions to perform the assessment (Table 3). Arguably, if this is to be the standard practice then there could be financial implications to the NHS, but this should be balanced against the financial burden of preterm labour.

The response rate to the survey is low (41.7%) compared to an average response rate of 57.5% among doctors [17]. It could be argued that the response rate could have been better if reminder questionnaires were sent to non-respondents. The researchers admit that the survey may not be representative and is likely biased and it could be that those who responded were the only ones who believe that active intervention during pregnancy after cervical excisional treatment is necessary. This limited survey has highlighted the lack of consensus on the need of standardised strategies in cervical assessment for the prediction of preterm birth in susceptible women. Nearly two thirds of the respondents do not believe that cervical assessment is required during pregnancy and

40% did not comment on their current practices. The survey also showed variations in practices. Digital, direct visual and transvaginal ultrasonographic assessments were all employed in the assessment of the cervix. The ideal and objective cervical screening test should be reproducible, acceptable, affordable, highly sensitive and specific. Digital and direct visual assessment of cervical length are crude and subjective and do not meet these standards in contrast to transvaginal ultrasonography, which is less subjective, and in addition, there is an accumulating experience with this technique. Apparently, the technique is popular among the respondents as 72% of them utilise it alone or in combination with other methods including 64.5% of those who thought cervical assessment is not essential.

The prevention of preterm delivery rests on the recognition of the predisposing factors and the diagnosis of a preclinical stage. Transvaginal ultrasonography of the cervix may have a role in the prediction of the risk of early preterm delivery in both high- and low-risk women and deserves further rigorous testing to prove its value in clinical practice. A study in 2006 [18] showed that transvaginal ultrasonography in high-risk women could, independently, demonstrate shorter cervical lengths than in low-risk controls and similar lengths to women with previous spontaneous preterm birth and could predict preterm birth in women who have had LEEP. A cervical length of <3.0 cm, further cervical shortening or opening of the cervix with uterine fundal pressure have all been suggested as predictive of preterm delivery or cervical incompetence requiring cerclage [19, 20]. A shortened cervical length in the mid-trimester may preferentially predict early, as opposed to later, spontaneous preterm birth in high-risk women [21]. Paradoxically, funnelling, as an independent finding, may not add appreciably to the risk of early gestational age at delivery associated with a shortened cervical length [19, 22]. A population-based prospective multi-centre study [23] provides a model that can give an accurate patient-specific risk of preterm delivery. It showed that the detection rate of screening by a combination of maternal factors and the measurement of cervical length was substantially higher than that of screening by each method alone.

There is no agreement among the respondents to the frequency and timing of cervical assessment. One third (34%) assess the cervix monthly and the practices of the rest is either not known (28%) or widely variable (38%) between a single assessment in the first trimester to assessment every 6–8 weeks. The timing of the cervical assessment is crucial, and common sense would indicate that this should start early in the second trimester when most of pregnancy losses due to foetal abnormalities would have occurred.

Cervical cerclage might be associated with reduced preterm labour and improved perinatal outcome in women with cervical changes detected by ultrasonography [24] and in certain high-risk group of women with recurrent late miscarriages [25]; however, other interventions might be contributory to the improved outcomes [26]. Early cervical cerclage does not appear to offer significant benefit over early transvaginal ultrasonography in women with unclear history of incompetent cervix [27]. There is uncertainty about the role of cervical cerclage for women who have a short cervix on ultrasound [24, 28, 29]; nonetheless, 62% of the respondents would offer cervical cerclage to women with previous pregnancy loss, PROM, SROM or cervical length of less than 2 cm. It is noteworthy that some of those who disagree with the evidence still assess the cervix by ultrasonography and would offer cervical or transabdominal cervical cerclage. More than half (56%) of the respondents would offer cervical cerclage between 13 and 16 weeks gestation and 16% extend the offer to 26 weeks. The end of the second trimester heralds the end of the natural foetal wastage; hence, choosing 13 weeks as the earliest time for the insertion of transvaginal cerclage is logical while the selection of 26 weeks as the latest cutoff time is probably influenced by advances in neonatal medicine and better neonatal survival rates achieved by many units in infants delivered at or beyond 26 weeks gestation. Although transabdominal cervical cerclage carries potentially higher morbidity [30], it may offer improved neonatal survival with lesser morbidity in carefully selected women [31–35] and performing the procedure preconceptionally might be a safer alternative [36]. Almost half of the respondents (48%) agree with this assumption and would offer it to women who had excisional treatment, repeated treatments, second trimester loss, preterm labour or PROM, and this could be an over-representation of those who would actively intervene.

The effect of cervical excisional treatments on the vaginal flora is uncertain and a Cochrane systematic review of five randomised controlled trials [37] has shown that there is no benefit in screening and treating all pregnant women for bacterial vaginosis in order to prevent preterm birth and its consequences; nonetheless, 20% of the respondents believe that previous excisional treatment will alter the vaginal flora.

Conclusion

The result of this limited survey does not claim accuracy in determining the opinion among practitioners and may have a tendency to bias; hence, it should be viewed with caution. Despite the majority of the respondents agreeing with the evidence that cervical excisional treatments poses obstetrical risk, there is a lack of consensus and consistency in the need and timing of cervical assessment for the prediction of the risk of preterm birth in susceptible women. Many respondents have failed to mention their current practices, and transvaginal ultrasonography alone or in combination with other methods is the most favoured technique used in cervical assessment. The presence of evidence that cervical excisional treatment for CIN

carries a real risk of pregnancy loss and morbidity warrants the need for an agreed and standardised strategy in cervical assessment and in intervention techniques. A more comprehensive national survey is required.

Acknowledgement We would like to thank all the respondents who spared part of their valuable time to fill this questionnaire.

Declaration of interest The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Appendix 1

Questionnaire for the management practices in pregnant women with excisional treatment (LLETZ, Laser cone, cold knife cone & LEEP) to cervix

There is evidence from research and literature review that women with previous excisional treatment to cervix has an increased the risk of late miscarriage, preterm labour, PROM, SROM (1, 2, 3, 4, 5). Please notice that some questions might require more than one answer.

1) Q. Do you agree?
   Yes ☐ No ☐
2) Q. Do you think that cervical assessment is essential in current pregnancy in women with previous history of excisional treatment to cervix?
   Yes ☐ No ☐
   If yes go to question no 4
   If No go to question no 3
3) Q. What is your current practice?

4) Q. How do you assess cervical length?
   - Digital ☐
   - TVS ☐
   - Speculum ☐
   - None of the above ☐

5) Q If yes how often it is required?
   - Monthly ☐
   - Each trimester ☐
   - Other please specify

6) Q. Do offer cervical cerclage?
   Yes ☐ No ☐
7) Q. If yes in which group of patients cervical cerclage is needed?
   - All women who had excisional treatment to cervix ☐
   - Women with two or more previous cervical excisional treatment ☐
   - Evidence of previous pregnant loss, preterm labour, PROM ☐.
   - Women with cervical length less than 2cm ☐

8) Q. At what gestation you think cervical cerclage should be offered?

9) Q. Do you think trans-abdominal cervical cerclage should be offered preconceptionally to women who had excisional treatment and had repeated treatments, second trimester loss, preterm labour, PROM?
   Yes ☐ No ☐
10) Q. Do you believe that previous excisional treatment will alter vaginal flora?
   Yes ☐ No ☐
11) Q. If yes, do you do HVS?
   Yes ☐ No ☐
12) Q. If yes then at what gestation do you do HVS?

13) Q. Any additional information you would like to add in the management of these women:

Thanks for your valuable time in filling this questionnaire

Appendix 2

Table 1 Illustration of the respondents' views about cervical assessment during pregnancy

Number of respondents (%)	Views
18 (36)	Cervical assessment during pregnancy is essential
31 (62)	Cervical assessment during pregnancy is not essential
1 (2)	No answer

Table 2 Illustration of the practices of 29 (58%) of the respondents

Number of respondents (%)	Practices
6 (12)	Treat women as low risk
3 (6)	Guided by the volume and type of treatment
1(2)	Assess in mid and late second trimester and in early third trimester
1(2)	Assess and counsels prior to treatment and during pregnancy
1(2)	No assessment if asymptomatic with normal colposcopy and smear
1(2)	Refer to the risk clinic if had a cone biopsy or repeated LLETZ
1(2)	Document the treatment to increase staff awareness
1(2)	Administer steroids
14 (28)	Assess the cervix only in certain conditions

Table 3 Outline of the conditions for cervical assessment by 14 respondents

The conditions	Number of respondents
Previous cone biopsy	5
Repeated treatment or two or more cone biopsy	4
Previous late miscarriage	1
Cone biopsy and multiple pregnancy	1
Cone biopsy and with evidence of cervical shortening	1
Problems with previous pregnancy and evidence of cervical shortening	1
The clinician is concerned	1
Total number	14

Table 4 shows the respondents' opinions regarding the indications for cervical cerclage

The indications for cervical cerclage	Number of respondents (%)
Previous pregnancy loss, PROM or SROM	12 (24)
Cervical length is less than 2 cm	13 (26)
Previous pregnancy loss, PROM or SROM and women with cervical length less than 2 cm	10 (20)
Two or more previous cervical excisional treatments, previous pregnancy loss, PROM or SROM and women with cervical length less than 2 cm	2 (4)
Two or more previous cervical excisional treatments and women with evidence of previous pregnancy loss, PROM or SROM	1 (2)
No comment	12 (24)

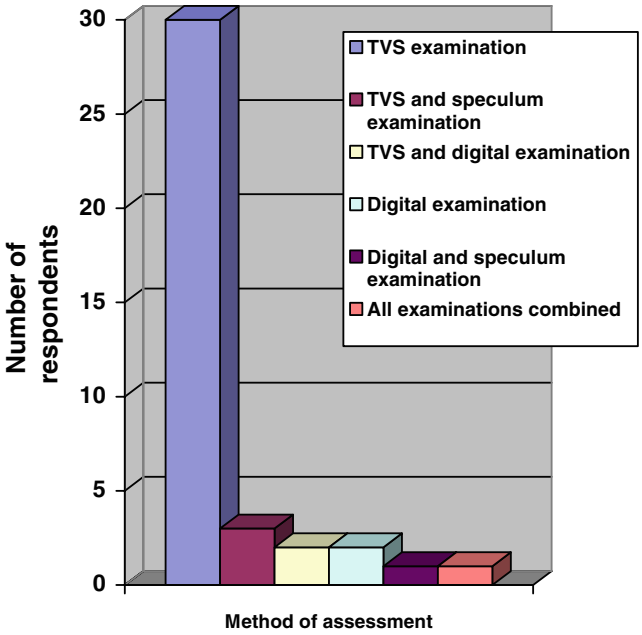
Table 5 Illustration of the timing of cervical cerclage insertion

Number of respondents (%)	Time of cerclage
28 (56)	13–16 weeks gestation
8 (16)	Up to 26 weeks
2 (4)	With evidence of funnelling or shortening
12 (24)	No comment

Table 6 Illustration of the timing of high vaginal swab

Time of HVS	Number of respondents
At booking	2
Monthly	3
Each trimester	1
16 and 28 weeks	1
No comment	2

Appendix 3



TVS: Trans Vaginal Sonography

Chart 1 Methods of cervical assessment

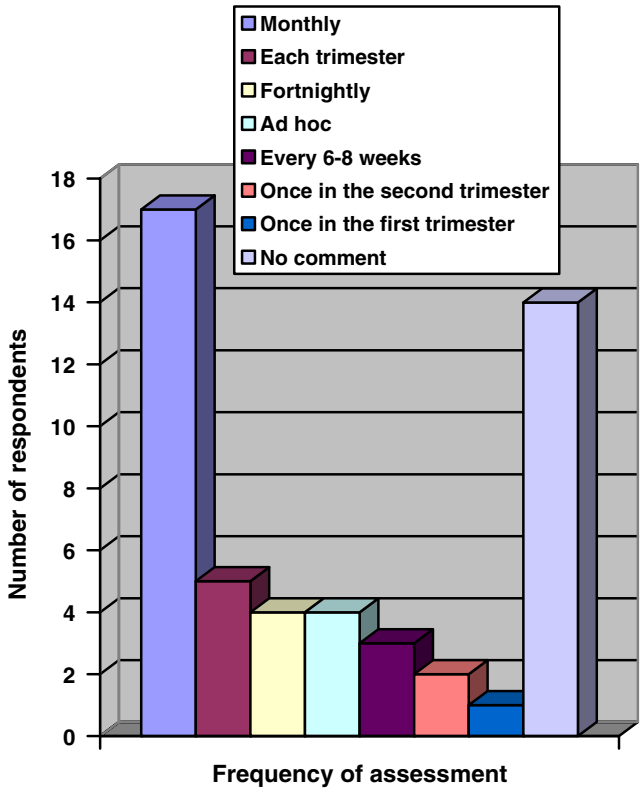


Chart 2 Frequency of cervical assessment

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