

Effect of Lower Uterine Segment Sweeping on Progress of Labor in Nullipara

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Abstract

Previous studies have shown that sweeping between the membranes and lower uterine segment was an effective procedure for reducing prolonged pregnancy. However, there has been no study to show the effect of lower uterine segment sweeping to the progress of the active phase of labor. This study was to determine the effect of lower uterine segment sweeping on the progress of the active phase of labor in nullipara. A total of four hundred nulliparous term pregnant women with spontaneous labor were randomized to one of two groups; the control group had routine vaginal examination while the study group had lower uterine segment sweeping at the time of each examination. Oxytocin infusion was given if there was dysfunctional labor. Progression of labor and the need for oxytocin augmentation were reviewed. Data were analyzed by chi square and Student *t*-test. Oxytocin was used in 67 per cent of the sweeping group and 62 per cent of the control group ($p=0.3$). The duration of the first stage (0.46), the second stage (0.38), and the third stage (0.28) of labor were not significantly different between the two groups. In conclusion, lower uterine segment sweeping did not reduce the need for oxytocin augmentation or lessen the duration of labor in nullipara.

Key word : Labor, Oxytocin, Pregnancy, Sweeping

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Dysfunctional labor is one of the major problems affecting women in spontaneous labor particularly in nullipara^(1,2). Oxytocin is widely used for stimulation of myometrium contraction when the progress of labor is slow^(2,3). However, administration of oxytocin can cause a wide range of adverse systemic effects such as water intoxication, neonatal jaundice and uterine hyperstimulation, which can cause fetal asphyxia and even uterine rupture^(3,4).

Sweeping of the membranes, a relatively noninvasive technique, can stimulate prostaglandins production by damaging the decidual cells. It increases prostaglandin $F_{2\alpha}$ metabolites releasing, phospholipase A_2 activity, and uterine contraction^(5,6). Randomized trials have shown that sweeping of the membranes is an effective procedure for shortening the pregnancy and reducing the induction rate for prolonged pregnancy⁽⁷⁻¹⁰⁾. However, there has been no study to show the effect of lower uterine segment sweeping to the progress of the active phase of labor.

The primary objective of this trial was to determine whether the effect of lower uterine segment sweeping could reduce the need of oxytocin for augmentation in nullipara. The second objective was to study the effect of this procedure on the duration of labor.

METHOD

This randomized controlled trial was conducted in a labor ward of a teaching hospital from 1 March 1998 to 30 April 1999 after the protocol had been approved by the departmental ethical committee. Pregnant women admitted to the labor ward with spontaneous labor were enrolled in this study. Inclusion criteria were: 1) nullipara, 2) gestational age 36 weeks or more, 3) a single live fetus in cephalic presentation, 4) no risk factors such as diabetes mellitus, hypertensive disorders, intrauterine growth restriction, or any symptom and sign of vaginal or cervical infection. Gestational age was calculated from the last menstrual period and confirmed by mid-trimester ultrasound. Ultrasonography was also performed prior to sweeping of the cervix and membranes. Women presenting with placenta previa or any contraindication to vaginal delivery were excluded.

The women were recruited for this study when they reached the active phase of labor (cervix effaced and 3-4 cm dilated) with intact membranes.

The eligible pregnant women were informed about the study and invited to participate. After obtaining written informed consent, the women were randomly allocated by random number into two groups, digital examination with lower uterine segment sweeping as the study group and normal digital examination as the control group. Amniotomy was performed in both groups of women after randomization. For the women in the study group, lower uterine segment sweeping was performed with every vaginal examination. Lower uterine segment sweeping was defined as digital separation 2-3 cms from the cervical opening and rotating the finger between the lower uterine segment of the uterus and the fetal head twice through 360 degrees. Women in the control group had only a vaginal examination for each review. The first sweeping was performed after amniotomy. Progress of labor was checked regularly at two hourly intervals by vaginal examination for assessing the progress of cervical dilation and then marked on the partograph. Uterine contraction and fetal heart rate were observed every 15 minutes in the first stage of labor and every 5 minutes in the second stage. Continuous fetal heart rate monitoring was performed if any fetal heart rate abnormality was detected. The women were diagnosed as having dysfunctional labor if progress of labor judging by cervical dilation was less than 1 cm per hour⁽¹¹⁾. Oxytocin infusion was then administered after ruling out cephalopelvic disproportion. Labor was managed according to standard labor protocol. Data on the use of oxytocin, progress, outcome and complications of labor were reviewed. The occurrence of metritis (the presence of maternal fever, uterine tenderness, leukocytosis, and foul-smelling lochia) and neonatal sepsis (clinical finding consistent with sepsis in association with a positive blood culture) were evaluated. The other neonatal outcome parameters studied were birthweight, Apgar score at 1, 5 minutes, morbidity and mortality.

Oxytocin augmentation rate of nullipara in our hospital was 60 per cent, thus, one-hundred and seventy pregnant women were required in each group to achieve a power of 80 per cent to detect a 25 per cent reduction rate of the use of oxytocin with a risk of type I error at 0.05 (two-sided test).

Categorical variables were summarized as numbers and percentage, while continuous variables were presented as means and standard deviations. Group differences in values were assessed with unpaired *t* test for independent samples, and dif-

ference in frequencies with χ^2 test. Statistical significance was defined as p value < 0.05 .

RESULTS

Four hundred nulliparous pregnant women were enrolled in this trial no drop-outs. There was no difference in maternal age (sweep: control; 25.7 ± 4.8 years: 25.6 ± 4.4 years) and gestational age (sweep: control; 38.9 ± 1.1 weeks: 38.7 ± 1.2 weeks) between the 2 groups. Oxytocin was used in 67 per cent of the sweeping group and 62 per cent of the control group ($p=0.3$). The length of labor was not reduced in the study group compared to the control group (Table 1). The outcome of labor and mode of delivery were also similar in both groups (Table 2). Maternal and fetal complications were not different (Table 2). Birth asphyxia occurred once in the sweeping group and twice in the control group. No neonatal sepsis was found.

DISCUSSION

Membranes sweeping has been practised since 1810 for induction of labor⁽¹¹⁾. Several randomized trials showed that sweeping membranes, a simple and non-invasive procedure, effectively promoted the onset of labor and significantly reduced the incidence of postterm pregnancy⁽⁷⁻¹⁰⁾ but none of them evaluated the effect of sweeping in the active phase of labor. It was of interest to study whether this procedure could induce enough production of prostaglandins for augmentation of labor. We studied only nullipara because they are at a greater risk for dysfunctional labor which needs oxytocin for augmentation and thus seem to have benefit most from lower uterine segment sweeping^(1,2,6,7,10).

Our hospital uses active management of labor as labor management protocol⁽¹²⁾. We perform amniotomy once the patients reach the active phase of labor. Dysfunctional labor is diagnosed if

Table 1. Labor characteristics.

	Sweeping (n=164)	Control (n=166)	P value
Duration of labor			
First stage (h)	5.1 ± 2.2	4.7 ± 2.2	NS
Second stage (min)	28.3 ± 20.5	26.5 ± 16.5	NS
Third stage (min)	5.8 ± 4.8	6.4 ± 4.6	NS
Degree of partograph	69.6 ± 9.3	69.4 ± 10.3	NS
Maximum dose of oxytocin (milliunit/min)	8.2 ± 4.8	8.2 ± 4.2	NS
Total dose of oxytocin (unit)	1.4 ± 1.2	1.4 ± 1.2	NS
Pethidine (mg)	94.5 ± 28.9	95.9 ± 32.4	NS
Number of vaginal examination	3.3 ± 1.3	3.3 ± 1.9	NS

N = number of vaginal delivery, Data are presented as mean \pm standard deviation. NS = not significant.

Table 2. Outcome of labor and complications.

	Sweeping (n=200) %		Control (n=200) %		P value
Birthweight (g)*	3129.5 ± 377.1		3144.1 ± 409.7		NS
Estimated blood loss (ml)*	369.8 ± 350.9		320.7 ± 125.5		NS
Cesarean section	36	18	34	17	NS
Maternal complications					
No	188	94	191	95.5	NS
PPH (% of vaginal delivery)	5	3	3	1.8	NS
Metritis	1	0.5	4	2	NS
Wound infection	2	1	1	0.5	NS
UTI	1	0.5	1	0.5	NS
Retained placenta	3	2.5	0		NS

*mean \pm SD, PPH = postpartum hemorrhage, UTI = urinary tract infection, NS = not significant.

progress of labor is slow, and oxytocin infusion will be administered. Only the women with membranes intact were recruited in this study because the duration of membranes rupture may have an impact on the progress of labor.

Although sweeping has a long term effect in reducing the number of prolonged pregnancies⁽⁷⁻¹⁰⁾, it did not produce any desirable effect in the active phase of labor in this study. Sweeping of the finger into the space between the membranes and the uterine cervix may not create the same effect as sweeping of the finger into the space between the fetal head and the membranes.

According to our study, lower uterine segment sweeping after the membranes rupture could

not reduce the need of oxytocin for augmentation. It may be because lower uterine segment sweeping during labor did not generate enough prostaglandins to stimulate uterine contraction during the active phase of labor or was sufficient to replace oxytocin. Thus, lower segment sweeping could not reduce the duration of labor or increase the speed of labor according to the degree of partograph. It could not even reduce the quantity of oxytocin used for augmentation. However, this procedure did not increase maternal or fetal complications.

In conclusion, lower uterine segment sweeping did not have any effect on the need of oxytocin augmentation or the progression of labor in nullipara.

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ผลของการใช้น้ำกวาดมดลูกส่วนล่างต่อการดำเนินการคลอดในหญิงตั้งครรภ์แรก

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จากการศึกษาที่ผ่านมาพบว่าการใช้น้ำกวาดระหว่างถุงน้ำคร่ำกับมดลูกส่วนล่างมีส่วนช่วยในการลดอุบัติการณ์ของการตั้งครรภ์เกินกำหนด อย่างไรก็ตามก็ยังไม่เคยมีการศึกษาถึงผลของการกวาดบริเวณมดลูกส่วนล่างต่อการดำเนินการคลอด การศึกษานี้เป็นการศึกษาถึงผลของการกวาดปากมดลูกส่วนล่างต่อการดำเนินการคลอดในหญิงตั้งครรภ์แรกโดยทำการศึกษาในหญิงตั้งครรภ์แรกจำนวน 400 ราย ที่มีอายุครรภ์ตั้งแต่ 36 สัปดาห์ขึ้นไป มาห้องคลอดด้วยอาการเจ็บครรภ์คลอด แบ่งหญิงตั้งครรภ์ออกเป็น 2 กลุ่ม กลุ่มละ 200 ราย กลุ่มควบคุมได้รับการตรวจภายในเพื่อดูการดำเนินการคลอดตามปกติ ส่วนกลุ่มทดลองจะได้รับการกวาดปากมดลูกส่วนล่างทุกครั้งที่ตรวจภายในเพื่อดูการดำเนินการคลอด โดยเปรียบเทียบระยะเวลาในการดำเนินการคลอด ความจำเป็นในการใช้ oxytocin เพื่อกระตุ้นการคลอดและภาวะแทรกซ้อนอื่น ๆ

จากการศึกษาพบว่าการใช้น้ำกวาดบริเวณมดลูกส่วนล่างไม่ลดระยะเวลาของการดำเนินการคลอดพบทั้งในระยะที่หนึ่ง ($P = 0.46$) ระยะที่สอง ($P = 0.38$) และระยะที่สาม ($P = 0.28$) นอกจากนี้ยังไม่ช่วยลดความจำเป็นในการใช้ออกซิโทซินเพื่อกระตุ้นการคลอด (กลุ่มควบคุม:กลุ่มทดลอง = 62% : 67%; $P = 0.3$)

กล่าวโดยสรุป การใช้ใช้น้ำกวาดบริเวณปากมดลูกส่วนล่าง ไม่มีผลต่อการดำเนินการคลอดและความจำเป็นในการใช้อoxytocin เพื่อกระตุ้นการคลอด

คำสำคัญ : การคลอด, ออกซิโทซิน, การตั้งครรภ์, การกวาดมดลูกส่วนล่าง

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