

Membrane Sweeping, does it enhance the onset of labour?

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ABSTRACT

Objective: The aim of this study is to assist the effect of multiple sweeping of the cervix on the onset of labour and on caesarean section rate.

Methods: 120 pregnancies at gestational age of 39 weeks, who were followed up antenatal at our clinic, were recruited. Only women with uneventful pregnancy course with singleton pregnancy were included. They were asked to participate in the study and were asked to choose between having cervical sweeping at 40 weeks gestation or to be left to continue without interference. The procedure was explained to all women and they were offered other possible modalities of care. As per our protocols; all women were allowed until 41 weeks gestation until they were admitted, if not delivered spontaneously, to induce their labour. Participants were grouped into two groups for the study purpose: Group one were pregnant women of 40 weeks' gestation completed, put in for cervical sweeping at 40 weeks plus 2 days, 40 weeks plus 4 days and 40 weeks plus 6 days. Group two were women at 40 weeks who were put in for prospective follow up awaiting spontaneous onset of labour. The two groups were compared looking at labour onset, rupture of membranes and caesarean section rate.

Results: Group one (n=60) included 19 primipara women and 41 multiparous. 49 women (82%) went into labour before they completed 41 weeks of gestation, 14 of them ended by caesarean delivery. The rest, 9 women (18 %), were induced, nine of them ended by caesarean section. In group one, a total of 23 women (30%) ended by caesarean delivery and a total of 10 (16%) had their membranes ruptured before the onset of labour.

Group two (n=60) included 18 primipara women and 42 multiparous. 39 women (68%) went into labour before they completed 41 weeks of gestation, 13 of them ended by caesarean delivery. The rest, 21 (32%) women, were induced, 8 of them ended by caesarean section. In group two, a total of 21 women (36%) ended by caesarean delivery.

Conclusion: Membrane sweeping increases the rate of spontaneous labour; it reduces the caesarean section rate and nevertheless, there is marginal increase in the rate of spontaneous rupture of membranes before the onset of labour.

Key words: sweeping, labour, rupture of membranes, caesarean section

Introduction

Sweeping of the membranes to induce labour is an old practice: in 1810, James Hamilton proposed inducing labour by sweeping the membranes instead of amniotomy, in order to avoid infection(1). However, it was not until the 1950s that sweeping of the membranes became the subject of scientific research. In 1958 Swann(2) reported that it was effective in women with a favorable cervix, but effectiveness was not explained until 1974 by Gustavii(3), who found that sweeping of the fetal membranes stimulated prostaglandin production by damaging the decidual cells. In 1993 McColgin et al(4) found that membrane sweeping was associated with an increase in both phospholipase A2 activity and prostaglandin F2 α concentrations.

Sweeping of the amniotic membranes, also termed stripping of the amniotic membranes, is a fairly simple method usually performed at the antenatal clinic. During vaginal examination, the operator's finger is introduced into the cervix, then, the lower pole of the membranes is separated from the lower uterine wall by a spherical movement of the examining finger. This interference has been proposed to initiate labour pain by local production of prostaglandins and thus potential uterine contraction, to reduce pregnancy duration or to avoid formal induction of labour with oxytocin, prostaglandins or artificial rupture of membranes. It is proposed that this can cause release of prostaglandins that may soften and thin the cervix. This in turn, can trigger labour pain to initiate naturally within the coming 48 hours. Studies were conducted on membrane sweeping; others on cervical massage(5), some found it to reduce post-term pregnancies(6), others failed to demonstrate its beneficial effect on obstetrical outcome(7).

Sweeping of membranes is a safe method to reduce the incidence of prolonged gestation in a low-risk population. None of the studies conducted on membranes sweep demonstrated any increase in either maternal or neonatal adverse outcomes (8). One study showed its efficacy on labor and delivery outcome, but this was limited to nulliparous who had unfavorable cervix(9). It has been shown that membrane sweeping done frequently did not influence the likelihood of delivery at 41 weeks of pregnancy. The important factor is Bishop's score at around 39 weeks and it predicts the duration of pregnancy more truthfully. Trans-vaginal ultrasound cervical length assessment is even better than Bishop's score in predicting the success of induction of labour(10). More studies would be required to determine if membrane sweeping influences the duration of pregnancy(11).

Our study was directed to establish the best conduct in managing pregnancies at term. Minimizing the number of women needing induction of labour is desired by all obstetric units. Membranes sweep at term is practiced by many obstetric units. It is easy and affordable, but it causes some discomfort to women already anxious late in pregnancy. We aimed to show our experience of membrane sweep and the worth of the discomfort it gives to women.

Methods

We conducted this study at the antenatal clinic of King Hussein Medical Center, a teaching hospital. Women included in the study were healthy women, with no past history of pregnancy complication such as growth restricted babies, diabetes or hypertension. All women had singleton pregnancy with no past history of caesarean section. The due expected delivery date was determined by early gestation ultrasound scans. We recruited women at 39 completed weeks of gestation after conducting late gestation scan to exclude cases with fetal malpresentation, large and small babies, amniotic fluid abnormalities and placenta praevia.

Women were asked to choose between having a cervical sweep at 40+2, 40+4 and 40+6 weeks gestation, and anticipating spontaneous labour prospectively with no intervention. Options were explained to participants and other modalities of managing late pregnancy were also offered.

Women who did not go into labour until 41 weeks completed pregnancy were admitted for active management to induce labour by prostaglandins as per labour protocols.

120 women fulfilled the requirements and accepted to participate in the study. They continued follow up until 41 weeks gestation. 60 women were scheduled for cervical sweeping and named Group one; the other 60 were planned for prospective management and named Group two.

Women in Group one, study group, (n= 60) had scheduled visits to the midwife for cervical sweep at 40+2, 40+4 and 40+6 weeks gestation. Women who were found to have labour pain or if the Bishop score was 8 or greater, at any time between 40 and 41 weeks of gestation, were considered positive; the rest were taken as failed.

Women in Group two, control group, (n=60) were asked to check for fetal wellbeing by ultrasound and kick charts until week 41 completed of gestation. If they had labour pain at any time between 40 and 41 weeks of gestation they were considered positive. Women who failed to go into labour spontaneously had cervical assessment. If Bishop score is 8 or greater, they were considered positive also. The rest were considered negative.

Chi-square test was conducted to find significance between the two groups. P-value was considered significant at $p < 0.05$.

Results

During a 12 month period, 207 women who fulfilled the criteria were asked to participate. 186 agreed to take part in the study. An additional 16 women were excluded because of malpresentation of the fetus. 12 women had ruptured membranes before 40 weeks of gestation. Another 22 went into labour before 40 weeks. 16 failed to present for evaluation and sweeping for unknown reasons. 120 women were left in the trial. The mean age for women in group one was 28.3, for group two it was 27.6 years.

Parity for group one was between zero and six, with mean parity of 3.85, and for group two between zero and 5, with mean of 3.39.

Women in both groups were comparable in regards to age and parity (Table 1).

Table 1: The age and parity of women for both groups

Groups' characteristics	Sweeping (n= 120)		Control (n= 120)	
	Mean	SD	Mean	SD
Age (years)	28.3	[4.1]	27.6	[3.2]
Parity	3.85	[1.9]	3.39	[1.7]

Values are given as mean [SD].

Successful spontaneous deliveries within one week were more likely in the sweeping group; forty one (68%) women in the sweeping group compared to 38 (65%) women in the control group, (OR 1.25).

Instrumental deliveries in both groups were comparable.

Caesarean section rate in the sweeping group was slightly lower compared to control group, (OR 0.75). Adverse effects related to sweeping were few: accidental rupture of the membranes occurred in one case, significant blood loss warranting a short observation occurred in another.

Neither spontaneous deliveries nor caesarean section rate difference in both groups reached statistical significance, (Table 2).

Table 2. Labour and delivery characteristics. Values are given as n (%).

	Group 1 Sweeping (n = 60) n (%)	Group 2 Control (n = 60) n (%)	OR (95% CI)	Chi-square	P value
Spontaneous labour	41 (68)	38 (65)	1.25 (0.58–2.66)	0.3334	0.56 n/s
Instrumental delivery	7 (12)	7 (12)	1	0	1 n/s
Caesarean section	12(20)	15 (25)	0.75 (0.31–1.77)	0.4301.	0.51 n/s

This result is not significant at $p < 0.05$.

Discussion

Sweeping of membranes has been used for a long time. The main reason is to reduce significantly the number of women reaching 41 weeks, in order to avoid difficult discussions about induction of labour. Pregnant women are doubtful about the benefit; they become hesitant when offered it by the obstetrician. The discomfort it causes adds to the hesitancy. We aimed to find out our own results so that counselling the patients will be boosted by our data. A recent randomized controlled trial(12,13), confirmed the effectiveness of elective induction of labour by different methods only at 41 weeks of gestation and beyond may be associated with a decrease in both the risk of cesarean delivery and of meconium-stained amniotic fluid. In our study we selected sweeping of the membranes as the method to induce labour, as well as studying the incidence of caesarean section and instrumental delivery.

Many randomized trials have been done to study the effect of sweeping of the membranes on the commencement of labour. Studies were conducted at term pregnancies and the results

were conflicting. Some of them found no difference in the outcome(7,14) and not praiseworthy. No increase in obstetric complications or increased risk to the mother and the fetus was found(8,15).

When offering cervical sweep, the mothers discomfort needs to be balanced against the benefit. Therefore some studies found that Sweeping of the membranes at term is safe and reduces the incidence of post-date gestation(16). Those studies found that weekly sweeping prepares women by putting them in a pre-labour situation where cervical ripening effect is enhanced by irregular contractions. They found that women assigned to sweeping of the membranes had an improved Bishop Score when admitted and less induction of labour rate, therefore frequent sweeping may have improved outcome when compared to a single one.

We conducted our study for women in different age groups; 18 to 40 years old (mean 28), with parity that ranged from nullipara up to para 5, (mean 3.5). Women who had cervical sweep, as per our study design, (at 40 weeks +2, +4 and +6 days), had marginal increased chance of delivering their babies

at 41 weeks gestation when compared to prospective management. This increase would enforce the previous studies with similar results although it did not reach statistical significance. The sample number used in our study is small, and other variables such as previous uterine scar were not included. This presents some limitation. Larger studies are needed to specify the efficacy of cervical sweep; for the true value for different women with different parity and in women with previous uterine scar, the frequency and the best timing is not established. Until then we cannot agree with studies that encouraged the cervical sweep.

We had two cases of unintended rupture of the membranes and one heavy show or vaginal bleeding during sweeping. Those incidents were not submitted to any analysis because of their paucity in our study. They may indicate that sweeping of the membranes is not entirely free of risk.

Conclusion

Cervical sweeping had no effect on the delivery rate or the caesarean section rates statistically; nevertheless, marginal increase was noted.

No difference in instrumental deliveries was found.

Larger studies are needed.

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