ORIGINAL ARTICLE

Is membrane sweeping appropriate in modern obstetrics for induction of labour in post date pregnancies?

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Abstract:

Objectives: to identify the effectiveness of sweeping of membranes at 40 weeks of gestation in prevention of post dates pregnancy by improvement in Bishop Score and initiation of labour.

Study design: Non-probability convenient sampling.

Setting and Duration: Department of Obstetrics and Gynaecology unit 1, Abbasi shaheed hospital Karachi. This Study was conducted for a period of six months from 1st October 2007 to 31st March 2008.

Subjects and methods: 100 pregnant women attending out patient department at 40 wks of pregnancy were selected for study. 50 were randomized to sweeping and 50 taken as control group. Sweeping was performed three times in study, first on Day 1, then on Day 3 and finally on Day 7 and outcome in terms of initiation of uterine contractions and change in Bishop Score was assessed. Sample size was determined by using the WHO software where α=5%, power of the test 1-β=90, anticipated population proportion 1, P1=0.40, anticipated population proportion 2, P2=0.20, sample size, n=89. The researcher recruited 100 subjects to avoid the chances of type 2 error.

Results: More women went into spontaneous labor in sweeped group as compared to control group 43/50(86%) vs.24/50(48%) OR 6.65 95% CI 2.5-7.5 (p=0.001). Less patients required formal methods of induction in sweeped group 7/50(14%) vs. 26/50 (52%) (p=0.001) in control group. In addition women allocated to sweeping have higher rate of vaginal deliveries 90% vs. 76% in control. Rate of C/S is higher in control as compared to sweeped group 12/50(24%) vs.5/50(10%) OR 4.94 95% CI 1.3-5.8 (p=0.012). 56% had spontaneous labor after one episode and 30% went into labour after two episodes of sweeping. Time between randomization and onset of labor was also less in sweeped group (67hrs vs.84 hrs).

Conclusion: sweeping of membranes is an effective method of initiating labor and it is safe and useful procedure which results in reduced incidence of prolonged pregnancy and subsequent reduction in the labor induction rate.

Keywords: Induction of labor, post-date pregnancy, sweeping of membranes.

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Introduction:

Prolonged pregnancy is defined as any pregnancy that exceeds beyond 294 days or 42 weeks from last menstrual period. Approximately 18 percent of pregnancies in the United States extend beyond 41 weeks, and 7 percent extend beyond 42 weeks[1]. As many as 20-30% of women undergo induction of labor and commonest indication, in around 35.5% is post date pregnancy[2]. Sweeping of membranes has been used in past for induction of labour but its effectiveness is still unclear. Sweeping is relatively simple, safe and easy technique for induction and performed by simple vaginal examination, introducing fingers into cervical os and detaching amniotic membranes from lower uterine segment. Cochrane systematic review of pregnancy and childbirth concluded that sweeping of membranes initiates labour by release of local prostaglandins and thus reduces the pregnancy duration and need

of other formal methods of induction like prostaglandins, amniotomy or oxytocin[3]. A recent cochrane metaanalysis of membrane sweeping trials also concluded that it reduces the number of pregnancy to post term gestations and need of formal labour inductions without any evidence of increase in maternal and neonatal infections but causes maternal discomfort and vaginal bleeding[4]. During late pregnancy the rise in PGs in the maternal blood following a vaginal examination is shown to reach a peak value within 5 min of intervention. The level of plasma PG after membranes sweeping alone were approximately one tenth those achieved during labour, which might sufficiently augment labour and improve delivery outcome.[5]

RCOG [6] and Canadian task force on preventive health care recommends in their guidelines for management of post term pregnancy that women should be offered the option of membranes sweeping commencing at 38 to 41 weeks following a discussion of risk and benefits[7].

The goal of intervention with such non-invasive technique is to prevent the patients from going post dates, which has its own hazards and also to avoid more formal methods of labor induction thus minimizing the risk of side effects. In country like ours where most of people belong to low socioeconomic class and couldn't afford expensive methods of induction and associated monitoring and admission due to their side effects it can emerge as safe, cheap and cost effective method.

We undertake this study to assess the effectiveness of membranes sweeping at 40 weeks of gestation in reducing the incidence of induction when induction was planned at 41 weeks of gestation. The sweeping was performed by single person and 3 times in a week to assess its effectiveness with repeated episodes. The main purpose of our study is to see the effect of membranes sweeping in our local population and setups, as very less data is available for this intervention in our local population and due to differences in results of previous studies.

Material and methods:

This study was conducted in obstetrics & gynecology unit 1 Abbasi Shaheed hospital in period of 6 months from October 2007 to March 2008. Total 100 numbers of women from out patient department were selected. There was no restriction on parity and booking of attending patients but all of them should be at 40 weeks of gestation either by early ultrasound (before 20 weeks) or by means of last menstrual period. Those with multiple pregnancies, malpresentation, placenta previa, and history of bleeding per vaginum in any trimester, absolute cephalopelvic disproportion, previous LSCS and any other contraindications of vaginal delivery were excluded. Sample size was determined by using the WHO software where α=5%, power of the test 1-β=90, anticipated population proportion 1, P1=0.40, anticipated population proportion 2, P2=0.20, sample size, n=89. The researcher recruited 100 subjects to avoid the chances of type 2 error. These 100 patients were divided into two groups of 50 each. Randomization of patients was done by simple random method (lottery method.) 100 sealed envelops were made with 50 papers of sweep and no sweep inside and patients were asked to pick any one of these envelops. No sweep group was taken as control and other was taken as study group in which intervention was done.

The patients allocated for sweeping were given full information about the procedure that was going to be performed. Once the patient was selected and consent was taken then all information regarding patient was put on pre-designed Performa. Salient features of Performa included; name, age, resident, parity, booked/nonbooked, LMP, EDD, per abdominal and per vaginal examinations.

To see the effect of sweeping properly on different bishop scores pairs of eligible women was matched for parity each was assign to membranes sweeping or gentle cervical examination to determine bishop score.

Bishop score assessed in two groups were dived into three categories:

- BS between 0-4 (poor bishop)
- BS between 5-7 (unfavourable)
- BS more than 8 (favourable)

Sweeping was done thrice in study first time at the start of procedure that is Day 1 then second time on Day 3 and finally third time on Day 7. In event of closed internal or external Os of cervix the cervical canal or external cervix was swept with 2 circular motions. After every episode of sweeping bishop score was noted and recorded on Performa to see the effect. Complications that were recorded include rupture of membranes; fever either intrapartum or post partum (other causes excluded), pains or discomfort at the time of procedure and bleeding per vaginum after sweeping. After three episodes of sweeping if no change was noted in bishop score or no uterine contractions started then patients were induced with other methods like PGE2, intracervical Foleys catheter or amniotomy. The factors which were considered as main outcome measures were, change in bishop score after every episode of sweeping, initiation of uterine contractions, time interval between procedure and onset of labour, possible complications, mode of delivery and need of other methods of induction and results are compared between two groups. Sample size was determined by using the WHO software where α=5%, power of the test 1-β=90, anticipated population proportion 1, P1=0.40, anticipated population proportion 2, P2=0.20, sample size, n=89. The researcher recruited 100 subjects to avoid the chances of type 2 error. Data was entered into statistical software package SPSS version 10. Chi-square test was applied to compare qualitative variables such as bishop score between two the groups. Quantitative variables like time interval between induction and onset of labour was presented by mean ±standard deviation and t- test was used to compare the quantitative variables. $p<0.05$ was considered as significant.

Results:

The demographic characteristics of study population are shown in Table 1. On Day1 of study, sweeping was done in 50 patients in whom 25 numbers of patients had poor BS (0-4), 15 patients had unfavourable BS (4-7) and only 10 had favourable BS (>8). In control group 23 patients had poor BS, 18 had unfavourable and 9 had favourable BS assessed by only P/V examination without sweeping. Table 2. When theses patients followed on Day 3, in patients of poor BS (≤4), 8/25(32%) vs.2/23(8.6%) went into labour. 3/25(12%) vs.16/23(69.5%) of them showed no change in BS and 14/25(56%) patients showed improvement in BS from poor (0-4) to unfavourable (5-7) vs. only 5/23(21.7%) in control groups. Similarly those with unfavorable BS (5-7) on Day1, when assessed on Day 3, 10/15(66.6%) vs. 6/18(33.3%) had spont. onset of labour, 5/15(33.3%) vs.4/18(22.2%) of them showed change in BS from (4-7) to (>8) and 8/18(44.4%) showed no change in BS in control vs. 0 in study group. Finally patients with favourable BS on Day 1 all of them had spont. onset of labour (100%) vs. 5/9(55.5%) and 4/9(44.4%) of them showed no change in BS in control group. Outcome on Day 3 is shown in Table 3. Sweeping was performed again on Day 3 in those who left undelivered, and then assessed on Day 7. On Day 7, in patients with poor BS

Table 1: *Characteristics of study population*

Characteristics	
Gestational Age (wks)	40.28±1.02
Age (yrs)	28.13±4.95
Booked	
Yes	63(63%)
No	37(37%)
Lmp	
Known	49(49.0%)
Not known	51(51.0%)
Parity	
P0	38(38.0%)
P1-4	35(35.0%)
P>5	27(27.0%)

Table 2: *Distribution of bishop score on day 1*

Group	**Study n**	**Control n**	**Total**	**%**
BS				
0-4	25	23	48	48
5-7	15	18	33	33
>8	10	9	19	19
Total	50	50	100	

Table 3: *Day 3 outcome in both groups*

		Group			
BS		**Study n (%)**	**Control n (%)**	**Total n**	**P value**
0-4	Spont. Labour	8 (32)	2 (8.6)	10	0.004
	Change in BS	14 (56)	5 (21.7)	19	
	No change in BS	3 (12)	16 (69.5)	19	
	Total	25	23	48	
5-7	Spont. Labour	10(66.6)	6(33)	16	0.012
	Change in BS	5 (33.3)	4(22)	9	
	No change in BS	0	8(44)	8	
	Total	15	18	33	
>8	Spont. Labour	10 (100)	5(55.5)	15	0.018
	No change in BS	0	4(44.4)	4	
	Total	10	9	19	

(0-4) on Day 1, 17 patients in study group and 21 patients in control group left undelivered and among them 10/17(58.8%) vs.5/21(23.8%) went into spontaneous labour in 48-72 hrs, 3/17(17.6%) vs.14/21(66.6%) of them still showed no change in BS and 4/17(23.52%) vs.2/21(9.9.5%) showed improvement on BS. Patients with unfavourable BS (5-7) on Day1, 5 patients in study and 12 patients in control group left. Among them 5/5(100%) vs.3/12(25%) went into spontaneous labor, 8 patients showed no change and one patient had improvement in BS in control group. Patients with favourable BS (>8)on Day 1 no patient left in study group on Day 7 while in control group out of 4, 3 had spont. labour and 1 still had no change in BS. Outcome of Day 7 is shown in Table 4. 7 patients in sweeped group left undelivered till Day 7 and again had sweeping for the third time.

Table 4: *Day 7 outcome in both groups*

		Group			
BS		**Study n (%)**	**Control n (%)**	**Total n**	**P value**
0-4	Spont. Labour	10 (58.8)	5 (23.8)	15	0.010
	Change in BS	4 (23.5)	2 (9.9)	6	
	No change in BS	3 (17.6)	14 (66.6)	17	
	Total	17	21	38	
5-7	Spont. Labour	5 (100)	3 (25)	8	0.019
	Change in BS	0	1 (8.33)	1	
	No change in BS	0	8 (66.6)	8	
	Total	5	12	17	
>8	Spont. Labour	0	3(75)	3	
	No change in BS	0	1 (25)	1	
	Total	0	4	4	

3/7(42.8%) of them still showed no change in BS so induced with PGs and 4/7(57%) of them had improvement in BS so induced with amniotomy on 41+4wks. In control group 26 patients left undelivered and among them 16 belonged to poor BS (0-4), 9 were of BS (5-7) and 1 patient was of BS>8. All of these patients were induced with different methods of inductions at 41 +4wks. (Table 5)

In addition women allocated to sweeping have higher rate of vaginal deliveries 90% vs. 76% in control. Rate of C/S is higher in control as compared to sweeped group 12/50(24%) vs.5/50(10%) OR 4.94 95% CI 1.3-5.8 (p=0.012). 56% had spontaneous labor after one episode and 30% went into labour after two episodes of sweeping. Time between randomization and onset of labor was also less in sweeped group (67hrs vs.84 hrs).

Rupture of membranes occurred in 32% of cases. About 52 % of patients felt discomfort and 8 % found this procedure painful. 26% of patients reported per vaginal bleeding and 9% became febrile after sweeping of membranes. (Table 6)

Discussion:

The main aim or objective of the study was to see the effect of sweeping of membranes in prevention of prolonged pregnancy by onset of labour or change in Bishop Score in low risk

Table 5: *Methods of induction in both groups*

	Group		
Induction	**Study n**	**Control n**	**Total**
Prostin	3	12	15
Amniotomy	3	12	15
Intracrvical	1	2	3
Foley's	43	24	67
Total	50	50	100

Table 6: *Complications of sweeping in study group*

	Frequency n	**Percent %**
Bleeding	13	26
Prom	16	32
Discomfort	26	52
Pain	4	8
Fever	5	9

pregnancies. Prolonged pregnancy causes anxiety in women and proper counseling during antenatal period that they are most likely to deliver between 38-42 weeks and not exactly on EDD can prevent such anxiety. Spontaneous labour is found to be related to greater incidence of vaginal deliveries and lesser incidence of instrumental deliveries and cesarean deliveries[8].

Cervical condition or Bishop Score is most important factor, which decides which method of induction should be used. Results revealed unacceptably high rates of prolonged labor, cesarean section, maternal pyrexia and depressed neonatal Apgar score in subjects with poor bishop score[9]. Foong et al. mentioned in his study that sweeping is also beneficial when used in conjunction with other labour induction method[10]. Although meta analysis of 14 randomized controlled trials has shown that routine use of sweeping of membranes from 38 weeks of gestation onward does not seem to produce clinically important benefit and even at 39 weeks of gestation has no significant clinical effect on duration of pregnancy[11] but still some other studies conducted world wide showed that sweeping of the membranes weekly from 39 weeks significantly decreases the number that will reach 41 weeks and induction of labour then becomes less necessary.[12] Keeping these studies in mind in our study sweeping was performed at 40 weeks of pregnancy to see its effect at this gestation. In other study Woong et al said that single episode of sweeping for women beyond 40 weeks does not reduce the formal induction of labour[13], so in this study sweeping is done three times in weeks at Day 1, Day 3 and Day 7 to see its effectiveness after multiple time procedure. We found that more than half of patients went into labour after single episode of sweeping and only 3 of the patients require induction of labor with other methods at 41+4wks due to no change in Bishop Score after 3 episodes of sweeping.

We have a policy of induction of labour at 41 + wks of gestation because and Royal College of Obstetrics and Gynaecology and Canadian Trial recommends that after 41 weeks gestation, if dates are certain women should be offer elective delivery and if cervix is unfavourable, cervical ripening should be undertaken. Our study revealed that better the Bishop score at the time of procedure more favorable the outcome is and induction with other methods was needed only in cases that had poor Bishop Score at start of procedure. There was no significant difference in results between primigravida and multiparae patients and results can be comparable on both groups.

The procedure of sweeping is found to be safe and its safety and efficacy is confirmed in other local study as well[14]. There is no evidence that sweeping the membranes increases the risk of maternal or neonatal adverse outcomes[15]. Stripping also does not increases the risk of GBS colonization, which is a significant cause of perinatal morbidity and mortality[16]. The complication most likely to occur was bleeding, pain, prelabour rupture of membranes and infection. The rate of PROM was slight high especially in those with more than 1 cm cervical dilatation[17]. About 70% of women found this procedure was associated with significant discomfort, one third of women complained significant pain. On VAS it has been seen that patient expressed more satisfaction with birth process despite more initial pain after sweeping.[18]

Conclusion:

Sweeping or stripping of membranes is effective procedure in initiating labours and also decreases the need of formal methods of induction. Timings of sweeping and number of sweeps performed are important factors in favour of procedure.

However this study was small to make any definite comments on its risk or benefits and only larger trials would achieve the appropriate power to confirm the results and if this procedure found to be as effective method of induction as in my study then it should be used as first option for women reaching 40 +weeks of pregnancy.

This procedure still has a role in modern obstetrics practice and can be considered as a responsible option in a term patient who is otherwise a

good candidate for outpatient ripening because it is a safe procedure and there is no evidence that sweeping increases the risk of maternal or neonatal adverse outcomes.

References:

1. Evan R, Richard B, Andrea L, Cristian et al. management of prolonged pregnancy AHRQ Evidence reports Number 53.AHRQ publication No. 02-E018, May2002.
2. Mazhar S B, Alam K. management of prolonged pregnancy AHRQ Evidence reports Number 53.AHRQ vol.23,24 2001: 31-3.
3. Boulvain M, Stan C, Iron O. Membrane sweeping for induction of labour. The Cochrane Database of systematic Reviews 2005, issue 1 CD000451.
4. Boulvain M, Stan CM, Irion O. [Intervention Review] Membrane sweeping for induction of labour. The Cochrane Database of systematic Reviews 2010, issue 1 CD000451.
5. McColgin I, Wiriyasirivaj B, Vutyananich T, Ruangsri RA. A randomized controlled trial of membranes stripping at term to promote labour. Obstet Gynaecol 1996; 87:767-770.
6. Royal College of Obstetricians and Gynaecologists (RCOG). Induction of labour, Evidence-based Clinical Guideline Number 9. RCOG Clinical Effectiveness Support Unit, London: RCOG Press; 2001.
7. Delaney M, Roggensack A, Leduc DC, Ballermann C et al. Guidelines for the management of pregnancy at 41+0 t0 42+0 weeks. J Obstet Gynaecol Can. 2008 sep;30 (9):800-23.
8. Shamim S, Zafar F, Farooq M. Value of partogram inprediction of outcome of delivery in primigravidae - a study of 100 cases Biomedica Jul-Dec.2001; vol 17: 34-7.
9. Ghazala M. Acceptability of Bishop scores for inducebility. Pak J Obstet Gynecol 1992; 5: 85-94.
10. Foong LC, Vanaja K, Tan G, Chua S. membrane sweeping in conjunction with labour induction. Obstetrics and Gynaecology Oct 2000 Oct; vol.96 No.4:539-42.
11. Kashanian M, Akbarian A, Baradaran H, Samie MM. Effect of membrane sweeping at term pregnancy on duration of pregnancy and labour induction: A randomized Trial. Gynecol Obstet Invest 2006; 62:41-4
12. Cammu H, Haitsma V. Sweeping of membranes at 39 weeks in nulliparous women: a randomized controlled trial. Br J Obstet Gynaecol 1998 Jan; 105(1): 41-4.
13. Woong SF, Hui SK, Choi H, Hol C. Does sweeping of membranes beyond 40 weeks reduce the need for formal induction of labour? BJOG June 2002; vol. 109: 632-36.
14. Mehmood H, Bashir A. Does sweeping of membranes in nulliparous women reduce the need for formal induction of labour? ANNALS OCT-DEC 2005; vol. 11 No. 4: 452-54.
15. Yildirim G, Gungorduk K, Karadag Ol et al. Membrane sweeping to induce labour in low-risk patients at term pregnancy: a randomized controlled trial. J Matern Fetal Neonatal Med. 2010 Jul; 23(7): 681-7
16. Netta D, Visintainer P, Bayliss P. Does cervical membrane stripping increase maternal colonization ofGroup B sterptoccocus.Am.J.Obstet.Gynecol.2002; 187[suppl.6]: S221
17. Hill MJ, McWilliams GD, Garcia-Sur D, Chen B, Munroe M, Hoeidtke NJ. The effect of membrane sweeping on prelabour rupture of membranes: a randomized controlled trial. Obstet Gynecol. 2008 Jun; 111(6): 1313-9.
18. Tan PC et al. Membrane sweeping at initiation of formal labour induction. A randomized controlled trial. Obstet Gynecol 2006 Mar; 107:569-77.