

Original article:

Membrane sweeping as a useful method for prevention of post term pregnancy: An experience from an Urban Health centre in Tamil Nadu

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Abstract

Background: Membrane sweeping is one of the recommended interventions to encourage spontaneous induction of labour at term. This procedure also prevents post term pregnancy and thus the maternal and foetal morbidity and mortality associated with it. We recorded the outcome of membrane sweeping in pregnant women at term done in our urban health centre.

Aims and Objectives: We aimed to record the maternal and foetal outcomes of membrane sweeping at term for low risk pregnant women in our urban health centre.

Study design and setting: This was a retrospective study done between the year 2011 and 2015 in the urban health centre, a secondary care hospital which had a nurse run antenatal clinic and labour room.

Materials and methods: Data was collected from the register of all women who had membrane sweeping between the year 2011 and 2015. Baseline distribution of parity, bishop score, gestational age at membrane sweeping and number of days for onset of labour were calculated. Their age, parity, maternal and foetal outcomes were followed up.

Results: A total of 240 pregnant women underwent membrane sweeping at term. Among these a significant proportion 55% went into spontaneous labour, 68.3% had normal vaginal delivery, 6.7% had instrumental delivery, and 7.1% had Caesarean section. Most of the babies (75.8%) had Apgar >8 at 1 minute and 80.1% had Apgar >8 at 5 minutes.

Conclusion: Membrane sweeping is a safe intervention at 40 weeks to facilitate spontaneous onset of labour.

Key words: Membrane sweeping, post term pregnancy, labour induction

Introduction

The incidence of post term pregnancy has been reported to be around 7% of all pregnancies. ^[1] Post term pregnancy is associated with increased risk of

stillbirths, increased likelihood of operative vaginal delivery, caesarean deliveries, shoulder dystocia, neonatal seizures, meconium aspiration syndrome and low 5-minute Apgar scores. ^[2,3,4] The maternal

risks are those associated with dysfunctional labour such as severe perineal laceration, infection and post-partum haemorrhage.^[5]

This increased foetal morbidity and mortality and maternal morbidity can be prevented by induction of labour at term. As inaccurate dating is one of the most common risk factor for post term pregnancy, efforts to establish gestational age by early first trimester ultrasound is one of the methods to decrease its incidence.^[6] The other methods of preventing post term pregnancy are to encourage spontaneous induction of labour at term by minimally invasive interventions. Few of the recommended interventions include membrane sweeping, unprotected sexual intercourse, nipple stimulation and acupuncture.^[7]

A randomized controlled trial done in India had concluded that the optimum time for induction of labour to prevent complications associated with post term pregnancy is at 41 weeks and 4 days.^[8] Membrane sweeping has been demonstrated to be effective in preventing proportion of post term pregnancy.^[9,10] We had planned interventions to prevent post term pregnancy in our nurse run low risk antenatal and delivery services. Accordingly we implemented first trimester ultrasound for dating of gestational age, non-stress test(NST), amniotic fluid surveillance for detecting oligohydramnios and membrane sweeping at term.

Aims and Objective:

This retrospective study was done to report the maternal and foetal outcomes of membrane sweeping at term in low risk pregnant women in a nurse run antenatal and delivery service.

Methodology

This is a retrospective study done at the urban health centre of a medical college in Tamil Nadu, South India. The urban health centre is situated two kilometres from the tertiary referral centre and serves a population of nearly two lakhs. Health

services are provided by family physicians, community health doctors, post graduate trainees and medical officers. The antenatal care services are provided by nurse midwives after initial screening by a physician. The centre has a two bed labour room but no facilities for caesarean section. This service was started in response to the request from the local population in 2005. It was evaluated in 2011 and it was found that a large proportion of referrals were for post-dated pregnancy.

From 2011, all pregnant women underwent confirmation of gestational age by ultrasound during their first trimester booking antenatal visit. All low risk pregnant women at 40 weeks of gestation underwent a non-stress test and amniotic fluid index estimation. If these two tests were within normal limits, sweeping of membranes was done at 40 weeks. Induction of labour for these pregnant women was planned at 41 weeks if they did not go into spontaneous labour. At induction, the cervix was ripened 12 hours earlier with Foley's catheter if Bishop Score was less than 6 and oxytocin drip was started the next day morning at 41 weeks of gestation.

Data between 2011 and 2015 was collected from the register where details of the pregnant women who underwent membrane sweeping were recorded. It was entered using Epi Data version 3.1 and analysed using SPSS version 16. Baseline distribution of parity, bishop score, gestational age at membrane sweeping and number of days for onset of labour were calculated. The proportion of pregnant women who had spontaneous onset of labour and induction of labour were calculated. Other outcomes like place of delivery, mode of delivery and Apgar scores were calculated as percentages. Factors associated with spontaneous onset of labour and induction of labour was also assessed using chi-square tests.

Results

During the period of June 2011 to December 2015, there were 11,584 antenatal consultations, 901 deliveries in our centre and 330(36.6%) referrals to the tertiary care centre. A total of 240(26.6%) pregnant women underwent membrane sweeping during this period. Thirty of these women did not come back for delivery and thirteen of the women who were referred had missing outcomes. There was equal distribution of nulliparous and multiparous women. Membrane sweeping was done at a mean gestational age of 40 weeks with a mean bishop score of 4.98. The mean gestational age of spontaneous onset of labour was 40 weeks and 3 days and for induction of labour was nearly 41 weeks (Table 1).

There was a significantly larger proportion(55%) who had spontaneous onset of labour(p=0.0015) following ripening of cervix by membrane sweeping(Table 2). More than two thirds of the women delivered in the urban health centre and had normal vaginal delivery. More than 75% of the babies had an Apgar score of ≥ 8 at 5 minutes. Only two children had very low Apgar scores at 5

minutes and one of them was an intra-uterine death. There were no maternal deaths reported during this period.

The referral rate was more among those who were induced 32.1% as compared to those who went in to spontaneous labour 20.5% following membrane sweeping but this was not statistically significant. Among those who had spontaneous onset of labour 10(37%) of them were referred for pre-labour rupture of membranes with unfavourable cervix, 7(25.9%) for foetal distress, 5(18.6%) for failure to progress, 3(11.1%) for maternal fever and 1(3.7%) each for prolonged 2nd stage of labour and shoulder presentation. The reasons for referral among the induction patients were 13(52%) for failure to progress, 6(24%) for unfavourable cervix, 2(8%) each for failed induction and foetal distress and 1(4%) each for oligohydramnios and intra uterine death. Among those who had spontaneous onset of labour and induction of labour, there was no significant difference with regard to parity, bishop score, mode of delivery and Apgar score at 5 minutes (Table 3)

Table 1: Baseline Characteristics

Variable	Number	Mean (SD)	Median	Range
Gestational Age at Membrane sweeping in Days	240	280.21 (1.46)	280	276-292
Bishop Score	240	4.98 (1.62)	5	1-9
Gestational Age at spontaneous onset of labour following membrane sweeping in Days	132	283.15 (2.03)	283	280-289
No. of days between membrane sweeping and spontaneous onset of labour	132	3.11 (1.99)	3	0-9
Gestational Age at induction of labour following membrane sweeping in Days	78	286.78 (1.84)	287	281-294

No. of days between membrane sweeping and induction of labour	78	6.29 (2.15)	7	1-14
Parity – Number(%)				
Primiparous	120(50%)			
Multiparous	120(50%)			

Table 2: Outcomes

Variable n=240	Number(%)
Onset of Labour	
Spontaneous	132(55%)
Induced	78(32.5%)
Not known	30(12.5%)
Place of Delivery	
Urban Health centre	158(65.8%)
Tertiary Referral Centre	49(20.4%)
Others	33(13.8%)
Mode of Delivery	
Normal	164(68.3%)
Instrumental	16(6.7%)
Caesarean	17(7.1%)
Not known	43(17.9%)
Apgar Score at 1 minutes	
≤ 3	5(2.1%)
4-7	10(4.2%)
≥ 8	182(75.8%)
Not known	43(17.9%)
Apgar Score at 5 minutes	
≤ 3	2(0.8%)
4-7	3(1.2%)
≥ 8	192(80.1%)
Not known	43(17.9%)

Table 3: Factors Associated with Spontaneous onset of labour and Induction of labour in Post-dated pregnancy

Risk Factors	Spontaneous onset of Labour	Induction of Labour	Chi-Square	p-value
Parity n=210				
Nulliparous	62(47%)	38(48.7%)	0.06	0.81
Multiparous	70(63%)	40(51.3%)		
Bishop Score n=210				
<6	72(54.5%)	48(61.5%)	0.98	0.32
≥6	60(45.5%)	30(38.5%)		
Referred N=210				
Yes	27(20.5%)	25(32.1%)	3.59	0.06
No	105(79.5%)	53(67.9%)		
Mode of delivery N=197				
Normal	107(85.6%)	57(79.2%)	1.36	0.24
Others	18(14.4%)	15(20.8%)		
Apgar Score N=197				
<8	2(1.6%)	3(4.2%)	0.36*	0.26
≥8	123(98.4%)	69(95.8%)		

*Fissure's Exact

Discussion

Membrane sweeping at term increases local production of prostaglandins which facilitate cervical ripening and spontaneous induction of labour.^[11] It is an ancient method for inducing labour.^[12] It is a simple procedure where in the physician during vaginal examination introduces the finger into the cervical os and by circular movement detaches the inferior pole of the membrane from the lower uterine segment. A Cochrane review has reported that sweeping of membrane promotes onset of labour and reduces the risk of post term pregnancy and the use of other methods of labour induction.^[13] Membrane sweeping does not increase the risk of maternal or

neonatal infections. In our study 55% of women developed spontaneous labour after membrane sweeping. There were no maternal infections or excessive vaginal bleeding reported in our study. A study done in a tertiary college in India concluded that membrane sweeping is a safe intervention to prevent post term pregnancy.^[14] One of the objectives of our low risk nurse run labour room was to reduce the referrals for induction of post term pregnancy. Our study demonstrated that implementing membrane sweeping reduced the referrals to tertiary care for post term pregnancy. Most of the referrals were for pre-labour rupture of membrane with unfavourable cervix, foetal distress and failure to progress. It is a safe and

simple intervention in a low risk set up to prevent complications due to post term pregnancy.

Hofmeyr et al had recommended membrane stripping in prevention of post term pregnancy in low resource settings.^[15] However this can be done only if the gestational age can be correctly estimated as this intervention is more effective at a gestational age of 40 weeks or more. As our centre had implemented estimation of gestational age at first trimester by ultrasound, membrane stripping could be done at the correct 40 weeks.

Thus implementation of accurate dating of gestational age by first trimester ultrasound, amniotic fluid index measurements at 40 weeks, membrane stripping and elective induction at 41 weeks contribute to reducing the risk of post term pregnancy in low resource settings. This approach to prevention will help urban and rural health

centres manned by nurses and medical officers in effective management of post term pregnancy.

Conclusion

Our study reports that membrane sweeping is a safe intervention at 40 weeks to facilitate spontaneous onset of labour in a low resource setting and thus to prevent post term pregnancy. The gestational age needs to be confirmed accurately by first trimester ultrasound.

Limitation

This is a retrospective study and general applicability in low resource settings would need a rigorous trial of this intervention. We also had some mothers with unknown outcomes.

Conflicts of interest

We hereby declare that the authors had no conflicts of interest.

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