Sweeping of Membranes for Induction of Labour in Low Risk Term Pregnancy

Hina Pirzada, Rabia Shabir*, Ambreen Ehsan, Noreen Tahir***, Zainab Saifuddin****, Ambreen Fatima*****

Combined Military Hospital Muzaffarabad/National University of Medical Sciences (NUMS) Pakistan, *Tehsil Headquarter Hospital, Pattika Pakistan, **Combined Military Hospital Mangla/National University of Medical Sciences (NUMS) Pakistan, ***Shifa College of Medicine, Islamabad Pakistan, ****Yusra General Hospital, Islamabad Pakistan, *****Fauji Foundation Hospital, Rawalpindi Pakistan

ABSTRACT

Objective: To determine the frequency of spontaneous labour in the swept and non-swept groups.
Study Design: Quasi-experimental study.
Study and Duration of Study: Department of Gynaecology and Obstetrics, Sheikh Khalifa bin Zayed Hospital, SKBZ Hosp/AK CMH Muzaffarabad, from Nov 2019 to Apr 2020.
Methodology: Patients were randomly divided into two groups (with lottery method). Group-A underwent a sweeping membrane while group-B was the control group. Spontaneous labour and other outcomes were observed in both groups.
Results: A total of 250 women were included in the study. There were 125 women in each group. The mean age of women was 23.4 ± 1.3 years in swept-group and 24.5 ± 1.7years in the non-swept group. The swept-group showed a high frequency of spontaneous labour compared to the non-swept group (24.8% vs 15.2%, p=0.01). Swept-group showed less postpartum haemorrhage (p=0.001), pain (p=0.001), pre-labour membrane rupture (p=0.03) and admission to neonatal intensive care unit (p=0.01).
Conclusion: Sweeping of the membrane is a safe and beneficial procedure for labour induction among low-risk term pregnant women. It is an effective procedure preventing women from reducing the incidence of post-term pregnancy with minimum complications.

Keywords: Induction of Labour, Sweeping membranes, Term Pregnancy.

How to Cite This Article: Pirzada H, Shabir R, Ehsan A, Tahir N, Saifuddin Z, Fatima A. Sweeping of Membranes for Induction of Labour in Low Risk Term Pregnancy. Pak Armed Forces Med J 2022; 72(2): 658-661. DOI: https://doi.org/10.51253/pafmj.v72i2.6644

INTRODUCTION

Labour induction is the artificial stimulus of the uterus for labour initiation.[1] 20-25% pregnancies requires labour induction as a common obstetric intervention. Labour induction is performed by manual rupture of amniotic membrane or oxytocin/prostaglandins administration to pregnant women.[2] In the last few decades, labour induction has continued to rise, especially in the developing world, where neonate delivery with labour induction is as high as one in four deliveries. Risk factors for labour induction include gestational age of 41 weeks, hypertensive disorder, fetal death, pre-labour amniotic membrane rupture, maternal medical complications, fetal growth restriction, vaginal bleeding, etc.[3]

The sweeping membrane is an important procedure of labour induction, also known as the stripping membrane. The sweeping membrane is a simple procedure that aims to initiate labour through the sequence of physiological events for pregnancy duration, reduction to pre-empt formal labour induction with either amniotomy, oxytocin or prostaglandins. The sweeping membrane is a common procedure performed by many clinicians currently.[4] In this technique, the physician introduces the finger into the cervical during a vaginal examination. The circular movement of the finger leads to the inferior pole of membrane detachment from the lower uterine segment. Local production of prostaglandins following this procedure results in affecting pregnancy duration. However, when the membrane cannot be reached, doctors perform cervix stretching unless sweeping is possible in some cases. Moreover, a cervical massage could be performed in case of close cervix.[5]

Yildirim *et al,* reported that sweeping of membrane is an effective and safe method for reducing the length of term pregnancy and incidence of prolonged gestational age. However, sweeping of membrane is not significantly associated with maternal and fetal complications.[6] Harmi *et al*, reported that sweeping of membrane has a beneficial effect on labour and delivery. It also showed a favourable impact on primigravida among those who received oxytocin alone.[7] Allot and Palmar reported that membrane sweeping is associated with a reduction in pregnancy duration (from 2-5 days). The frequency of labour

Correspondence: Dr Ambreen Ehsan, Classified Gynecologist, Combined Military Hospital, Mangla Pakistan
Received: 26 Apr 2021; revision received: 01 Aug 2021; accepted: 02 Aug 2021

induction was 8.1% and 18.8% in swept and control groups respectively.[8]

In Pakistan, data available on the sweeping of membrane for labour induction is not enough to make any conclusion. The present study will help understand the efficacy of membrane sweeping in low-middle income countries with the resource-limited setting. This study was planned to determine the frequency of spontaneous labour in the swept and non-swept groups.

METHODOLOGY

This quasi-experimental study was conducted at the Department of Gynaecology and Obstetrics, Sheikh Khalifa bin Zayed Al Nahyan Hospital AK CMH Muzaffarabad. The study duration was six months (Nov 2019-Apr 2020). The sample size of 250 cases (125 cases in each group) was calculated with 80% power of the study, 5% level of significance and taking expected percentage of spontaneous onset of labour as 48.6% with membrane sweeping and 32.4% without membrane sweeping for induction of labour in low-risk term pregnancy using WHO calculator.[9] Patients were selected through non-probability consecutive sampling. Research permission was taken from the Hospital Ethical Committee (IERB#399).

Inclusion Criteria: All the women of age 20-30 years, with gestational age 38-40 weeks (through LMP), primigravida pregnancy, intact membrane with Bishop scores ≤5 using clinical examination procedure for assessment, women presented with uncomplicated singleton, live cephalic fetus (assessed through ultrasonography) for normal delivery were included in the study.

Exclusion Criteria: Fetal macrosomia (estimated fetal weight >4.0 kg on ultrasound), cephalopelvic disproportion, gross fetal anomalies, with eclampsia or preeclampsia (B.P >140/90 ad protein urea +1 on dipstick), gestational hypertension (B.P >140/90 mmHg on two occasion), gestational diabetes (GTT >11.1 mmol/l, >200 mg/dl) and anemic patients (Haemoglobin <10 mg/dl) were excluded.

All the participating women signed consent forms. Patients were randomly divided into two groups (using the lottery method). In group-A, sweeping membranes were done, and group-B was the control group. In group-A, sweeping membranes was done only once by separating the lower part of fetal membranes as much as possible from its cervical attachment with three circumferential passes of the examining fingers, and if the cervix was closed, cervical massage was done by the researcher herself. After a few hours of observation, patients were discharged if they were well. The women were instruc-ted to come to the hospital if they experienced "show" decreased fetal movements, rupture of membranes, excessive vaginal bleeding or suspected onset of labour. No intervention was done in group-B. All patients were followed weekly until delivery by the researchers.

Statistical Package for Social Sciences (SPSS) version 26.0 was used for the data analysis. Quantitative variables were summarized as mean ± SD and qualitative variables were summarized as frequency and percentages. Chi-square test was applied to find out the association. Independent sample t-test was applied to find the mean differences among the groups. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

A total of 250 women were included in the study. There were 125 women in each group. The mean age of women was 23.4 ± 1.3 years in swept-groups and 24.5 ± 1.7 years in the non-swept group. Overall, 139 (55.6%) patients reported with no to mild pain, 68(27.2%) reported moderate, and 43(17.2%) patients reported severe pain. Overall, APGAR scores were less than 7 in 50 (20%) patients, while 200(80%) showed APGAR scores >7. Spontaneous labour was seen in 100(40%) cases. 54 (21.6%) neonates were admitted to the intensive care unit. Premature labour was seen in 30 (12%). Out of all, 34 (13.6%) patients showed postpar-tum haemorrhage, while 216 (86.4%) did not show postpartum haemorrhage. 41 (16.4%) showed maternal infection among all the patients, while 209 (83.6%) did not report the infection. The swept-group showed mean Bishop scores were 4.54 ± 0.72 while in no-swept group 4.48 ± 0.99.

The swept-group showed a high frequency of spontaneous labour compared to the non- swept group (24.8% vs 15.2%, *p*=0.01). Swept groups showed a low frequency of severe pain compared to the non-swept group (10% vs 17.2%, *p*=0.001). There was no significant difference in APGAR scores of the two groups (*p*=0.874), as shown in Table-I.

Non-swept group showed a high frequency of neonatal intensive care unit admissions compared to swept group (14% vs 7.6%, *p*=0.01). A high frequency of postpartum haemorrhage was found in the non-swept group as compared to swept group (10.4% vs 3.2%, *p*=0.001). The swept-group showed a low freq-

uency of maternal infection compared to the non-swept group (6% vs 10.4%, p=0.08). Pre-labour rupture of the membrane was high in the non-swept group as compared to swept group (p=0.03), as shown in Table-II.

Table-I: Comparison of spontaneous labour and other outcomes in swept and non- swept group.

Spontaneous Labour	Interventional Groups		*p*-value
	Group A (Swept)	Group B (Non-swept)	
No	63 (25.2%)	87 (34.8%)	0.01
Yes	62 (24.8%)	38 (15.2%)	
Pain (Visual Analogue Scale)			
No-mild	96 (38.4%)	43 (17.2%)	0.001
Moderate	25 (10%)	43 (17.2%)	
Severe	4 (1.6%)	39 (15.6%)	
Apgar Score ≤7			
No	99 (39.6%)	101 (40.4%)	0.874
Yes	26 (10.4%)	24 (9.6%)	

Table-II: Comparison of neonatal and maternal complications in swept and non- swept group.

Admission to Neonatal Intensive Care Unit	Interventional Groups		*p*-value
	Group A (Swept)	Group B (Non-swept)	
No	106 (42.4%)	90 (36%)	0.01
Yes	19 (7.6%)	35 (14%)	
Postpartum Haemorrhage			
No	117 (46.8%)	99 (39.6%)	0.001
Yes	8 (3.2%)	26 (10.4%)	
Maternal Infection			
No	110 (44%)	99 (39.6%)	0.08
Yes	15 (6%)	26 (10.4%)	
Pre-Labour Rupture of Membrane			
No	118 (47.2%)	102 (40.8%)	0.03
Yes	7 (2.8%)	23 (9.2%)	

DISCUSSION

Sweeping of membrane is the common and old procedure for labour induction.[10] Literature reported that sweeping of membrane is associated with shor-+tening pregnancy duration after 41 weeks and saving the infant from postpartum complications.[11]

In the present study, sweeping of membrane leads to patients' more spontaneous labour than non-sweeping (p=0.01). Goldenberg *et al,* reported that the incidence of labour induction is reduced at 41 weeks of pregnancy after sweeping of membrane.[12] However, Boulvain *et al*, reported no difference in the incidence of labour induction in the sweeping and non-sweeping group.[13] Wiriyasirivaj *et al,* reported that membrane sweeping is an effective and safe procedure for labour onset promotion at term. They reported that 41% of patients underwent membrane stripping delivered within one week compared to controls (p=0.014).[14] Boulvain *et al*, reported that sweeping membrane from 38 weeks of pregnancy did not show any beneficial effects. Furthermore, there is a need to balance the reduction of formal methods against women's discomfort and other complications.[15]

In the present study, the APGAR score did not differ in both groups. However, admission to NICU was significantly low in the kin swept group (p=0.01). Khashanian *et al,* reported that most infants delivered from the sweeping-group showed less admission to NICU (p=0.02) while the non-sweeping group showed more infants admission to NICU.[16] Another similar study finding corresponds with our study. They did not find any association between Apgar scores and sweeping of membrane (p=0.432).[17]

In our study, postpartum haemorrhage, pain, pre-labour membrane ruptures and maternal infections were less in the sweeping group than in the non-sweeping group. Tan *et al,* reported that postpartum haemorrhage is a common complication of membrane sweeping. Another similar study reported contradictory findings. They reported no significant difference in pain and discomfort of women in the sweeping and non-sweeping group.[18] Averill *et al*, reported that fever/maternal infection is more prone in the sweeping membrane group.[19] However, Hill *et al,* reported that sweeping membrane is a safe procedure with minimum adverse events.[20]

CONCLUSION

Sweeping of membrane is a safe and beneficial procedure for labour induction among low-risk term pregnant women. It is an effective procedure preventing women from reducing the incidence of postterm pregnancy with minimum complications. Further research is required on the cost-effectiveness of this procedure.

Conflict of Interest: None.

Authors' Contribution

HP: Direct contribution, RS: Intellectual contribution, AE: design, NT: Data analysis, ZS: Intellectual contribution, AF: Interpretation of data.

REFERENCES

1. Chauhan SP, Ananth CV. Induction of labor in the United States: a critical appraisal of appropriateness and reducibility. Semin Perinatol 2016; 36(3): 336–343.
2. Rayburn WF, Zhang J. Rising rates of labor induction: present concerns and future strategies. Obstet Gynecol 2016; 100(4): 164–167.
3. Davey MA, King J. Caesarean section following induction of labour in uncomplicated first births- a population-based cross-sectional analysis of 42,950 births. BMC Pregnancy Childbirth 2016; 16(2): 92.

4. Dare FO, Oboro VO. The role of membrane stripping in prevention of post- term pregnancy: a randomized clinical trial in Ile- Ife, Nigeria. J Obstet Gynaecol 2012; 22(3): 283-286.
5. Gupta R, Vasishta K, Sawhney H, Ray P. Safety and efficacy of stripping of membranes at term. Int J Gynaecol Obstet 2019; 60(2): 115-121.
6. Yildirim G , Güngördük K, Karadağ IO, Aslan H, Turhan E, Ceylan Y. Membrane sweeping to induce labor in low-risk patients at term pregnancy: a randomised controlled trial J Matern Fetal Neonatal Med 2016; 23(7): 681-687.
7. Harmi AJ , Chibber R, Fouda M, Mohammed KZ, Saleh EE, Tasneem A. Is membrane sweeping beneficial at the initiation of labor induction? J Matern Fetal Neonatal Med 2017; 28(10): 1214-1218.
8. Allott HA, Palmer RC. Sweeping the membranes: a valid procedure in stimulating the onset of labour?. Br J Obstet Gynaecol 2016; 100(10): 898-903.
9. Magann EF, Chauhan SP, McNamara MF, Bass JD, Estes CM, Morrison JC. Membrane sweeping versus dinoprostone vaginal insert in the management of pregnancies beyond 41 weeks with an unfavorable cervix. J Perinatol 1999; 19(3): 88-91.
10. Tannirandorn Y, Jumrustanasan T. A comparative study of membrane stripping and nonstripping for induction of labor in uncomplicated term pregnancy. J Med Assoc Thai 1999; 82(3): 229-232.
11. Foong LC, Vanaja K, Tan G, Chua S. Membrane sweeping in conjunction with labor induction. Obstet Gynecol 2017; 96(30): 539-542.
12. Goldenberg M, Dulitzky M. Stretching of the cervix and stripping of the membranes at term: a randomised controlled study. Eur J Obstet Gynecol Reprod Biol 2018; 66(2): 129-132.
13. Boulvain M, Stan C, Irion O. Membrane sweeping for induction of labour. Cochrane Database Syst Rev 2018; 2005(1): 451.
14. Wiriyasirivaj B, Vutyavanich T, Ruangsri AR. A randomized controlled trial of membrane stripping at term to promote labor. Obstet Gynecol 1996; 87(5 Pt 1): 767-770.
15. Boulvain Y, Tanapat Y. Reduction of pregnancy with gestational age more than 41 weeks by membrane stripping to induce labor: a randomized controlled clinical trial. Thai J Obstet Gynecol; 2020: 11(4): 267.
16. Kashanian M, Akbarian A. Effect of membrane sweeping at term pregnancy on duration of pregnancy and labor induction: a randomized trial. Gynecol Obstet Invest 2016; 62(1): 41-44.
17. Kaul V, Aggarwal N, Ray P. Membrane stripping versus single dose intracervical prostaglandin gel administration for cervical ripening. Int J Gynaecol Obstet 2014; 86(4): 388-389.
18. Tan PC, Jacob R, Omar SZ. Membrane sweeping at initiation of formal labor induction: a randomized controlled trial. Obstet Gynecol 2016; 107(3): 569-577.
19. Averill KA, Scardo JA, Chauhan SP. Weekly membrane stripping to decrease the incidence of postterm pregnancy: a randomized clinical trial. Obstet Gynecol 1999; 93(Suppl-4): S47.
20. Hill MJ, McWilliams GD, Garcia D, Chen B, Munroe M, Hoeldtke NJ. The effect of membrane sweeping in uncomplicated pregnancies on prolabor rupture of membranes, a prospective randomized controlled trial. Obstet Gynecol 2018; 111(Suppl-4): S11.

.....