# A Comparative Study of Induction of Labour Vs Expectant Management in Pregnant Females from 39 weeks to 41 weeks of Pregnancy

**Dr Divyeshkumar Panchal[1], Dr Vandana Saini[2*], Dr Shailee Bhatt[3]**

[1] Associate professor, Department of Obstetrics and Gynaecology, GCS medical college and hospital, Ahmedabad
[2*] Associate professor, Department of Obstetrics and Gynaecology, NHL municipal medical College, Ahmedabad
[3] IIIrd Year resident, Department of Obstetrics and Gynaecology, GCS medical College and hospital, Ahmedabad

**Corresponding Author:** Dr Vandana Saini

**Email**: vandana9599@gmail.com

## Abstract

**Background:** The present study assessed the maternal and foetal outcomes of both induced and spontaneous labour in 39 to 41 weeks pregnant women. **Material & Methods:** A comparative study was conducted among 200 women including 100 women in spontaneous labour group and 100 women in induced labour group. Maternal and fetal outcomes like antenatal complications, duration of labour, mode of delivery, indication for caesarean delivery, maternal complications, meconium staining of liquor, birth weight, APGAR score and NICU admissions were studied. **Results:** Mean maternal age was similar among both study groups. Majority of patients in both groups had gestational age between 39 to 40 weeks. Antenatal complications like PROM, oligohydroamnios etc. were more prevalent in induced women. Caesarean section rate was significantly high among the induced group in both nulliparous and multiparous women as compared to spontaneous labour group. Most common indication of caesarean section was fetal distress in both groups. Birth weights of babies were similar in the study groups. Induction was not found to affect meconium staining of liquor and APGAR score of babies and NICU admission rates. **Conclusion:** Although induction of labour increases the odds of caesarean section, it has no adverse effects on mother or baby. Hence induction of labour can be recommended as a safe technique for pregnant women with delayed gestation.

**Keywords:** Expectant management, Induction of labour, spontaneous labour, Maternal, Fetal

## Introduction

Labour is a natural physiological process defined by a rise in the frequency, strength and duration of uterine contractions, which results in effacement and dilation of cervix and descent of baby via birth canal. This physiological mechanism may become abnormal at times. Failure to recognize this would result in extended labour, increasing morbidity and mortality for both foetus and mother.[1] Labour induction is the artificial initiation of labour before it begins naturally. It is one of the most prevalent pregnancy procedures. Pregnancy after the due date is one of the reasons for inducing labour.[2] As the pregnancy continues beyond 40 weeks of gestation, there are higher risks of developing fetal distress and fetal death due to a decline in placental function and increased operative delivery.[3,4] The ideal care of

pregnancy after 40 weeks is unknown and it comprises elective induction of labour or expectant management until patient goes into spontaneous labour or requires a caesarean section, depending on the circumstances.[5] Induction of labour can be performed for various reasons, considering maternal or foetal health. Induction of labour can be performed to reduce the risk of complications for pregnant women, such as post-term pregnancy, oligohydramnios, or intrauterine foetal mortality during prolonged gestations.[2,6]

In case of induction of labour, if treatment fails, the final result is a caesarean section. Hence the grounds for induction of labour must also be adequate causes for a caesarean section. "Generally, induction of labour has appeal as a therapeutic option when the advantages of expedited delivery exceed the dangers of extending the pregnancy," according to the American College of Obstetricians and Gynaecologists' practise advisory on induction of labour.[7] Advantage of labour induction must be evaluated against the procedure's possible maternal and foetal dangers. Due to the benefits and drawbacks of induction of labour involved, this study was conducted to assess the maternal and foetal outcomes of induced and spontaneous labour in 39 to 41 weeks, pregnant women.

## Material and Method

### Study setting, study type and study duration

A hospital-based comparative study was conducted at the Department of Obstetrics and Gynaecology, GCS hospital, medical college and research centre, Gujarat from July 2017 to July 2019. (GCSMC/EC/Research project/APPROVE/2022, Date: 13/01/2022)

### Study participants

The study included registered patients who were attended in the labour room of Obstetrics and Gynaecology Department of our institute. Women with a singleton pregnancy, Cephalic presentation, Gestational age between 39 to 41 weeks and Bishops score four or less were included. Women with moderate anaemia, mild preeclampsia, gestational diabetes mellitus and premature rupture of the membrane were also included in the study. Women with malpresentation, placenta previa, abruption placenta, multifetal pregnancy, intrauterine fetal death, contracted pelvis, severe preeclampsia/eclampsia and grand multipara were excluded. Women with a previous history of difficult and traumatic delivery, caesarean section or myomectomy were also excluded. Participants were acquired purposively for the study. Eligible women (n=100) between 39 - 41 weeks of gestation were offered elective labour induction. They were compared with other 100 pregnant women between 39 - 41 weeks of gestation who were allowed to progress spontaneously during the study period.

### Data collection

All participants were addressed briefly about the study. A detailed history was taken and clinical examination was done. Routine antenatal, postnatal and neonatal investigations were performed as clinically indicated. Fetal distress was assessed subjectively by fetal heart rate monitoring. Induction methods used were oxytocin infusion, intracervical $PGE_2$ gel and combined methods involving stripping of membranes with oxytocin infusion in indicated cases. Women were counselled and induction of labour was done after taking informed consent.

Labour was classified as induced if oxytocin or prostaglandins were administered before a cervical dilatation of 3 cm. Augmentation of labour was carried out whenever required with oxytocin. Maternal and fetal outcomes were analyzed. Parameters such as route of delivery, caesarean section rate, colour of amniotic fluid, APGAR scores at 10 minutes, rates of NICU admission and maternal complications were analyzed.

### Data analysis

Data were entered and analyzed with epi info CDC version 7. Continuous variables were expressed as mean and standard deviation. Categorical variables were expressed as percentages. Difference between continuous variables of both groups was tested by an independent sample t-test, while association

between categorical variables was tested using Chi-square test. P-value less than 0.05 was considered as statistically significant.

## Results

**Table 1 Sociodemographic characteristics of study participants (n=200)**

| Variables | Spontaneous Group (n=100) | Induced group (n=100) | P-value |
|---|---|---|---|
| **Mean age (years)** | 24.36 ± 3.85 | 23.99 ± 3.88 | 0.49* |
| **Age groups** ≤20 years | 12 (12%) | 11 (11%) | |
| 21-25 years | 58 (58%) | 64 (64%) | |
| 26-30 years | 20 (20%) | 16 (16%) | |
| ≥30 years | 10 (10%) | 9 (9%) | |
| **Parity** 0 | 42 (42%) | 43 (43%) | 0.12$^{\Psi}$ |
| 1 | 36 (36%) | 39 (39%) | |
| ≥2 | 22 (22%) | 18 (18%) | |
| **Gestational age** 39 – 40 weeks | 52 (52%) | 55 (55%) | 0.66$^{\Psi}$ |
| 40 – 41 weeks | 48 (48%) | 45 (45%) | |

$^{\Psi}$P-value is calculated by chi-square test, *P-value is calculated by unpaired t-test

**Table 2 Comparison of Intrapartum events between study groups (n=200)**

| Variables | Spontaneous group (n=100) | Induced group (n=100) | P-value |
|---|---|---|---|
| **Mode of delivery** | | | |
| Normal vaginal delivery | 82 (82%) | 66 (66%) | 0.01* $^{\Psi}$ |
| Instrumental delivery | 3 (3%) | 5 (5%) | |
| Caesarean delivery | 15 (15%) | 29 (29%) | |
| **Mode of Delivery in nulliparous** | | | |
| Normal vaginal delivery | 30 (73.17%) | 24 (57.14%) | 0.02* $^{\Psi}$ |
| Instrumental delivery | 2 (4.88%) | 3 (7.14%) | |
| Caesarean delivery | 9 (21.95%) | 15 (35.72%) | |
| **Mode of delivery in multiparous** | | | |
| Normal Vaginal delivery | 52 (88.14%) | 42 (72.41%) | 0.005* $^{\Psi}$ |
| Instrumental delivery | 1 (1.69%) | 2 (3.45%) | |
| Caesarean delivery | 6 (10.17%) | 14 (24.14%) | |
| **Indication of LSCS$^{\#}$** | | | |
| Fetal distress | 9 (60%) | 20 (68.97%) | 0.61 $^{\Psi}$ |
| Non-progress of labour | 4 (26.67%) | 5 (17.24%) | |
| 2$^{nd}$ Stage Arrest | 2 (13.33%) | 4 (13.79%) | |
| **Augmentation with oxytocin** | | | |
| Done | 40 (40%) | 24 (24%) | 0.02* $^{\Psi}$ |
| Not done | 60 (60%) | 76 (76%) | |
| **Duration of the first stage of labour in hours** | 7.63± 2.08 | 7.05 ± 2.17 | 0.06$^{\S}$ |
| **Duration of the second stage of labour in minutes** | 21 ± 12.4 | 23.4 ± 14.5 | 0.6$^{\S}$ |

#LSCS -Lower segment caesarean section, *Statistically significant difference observed between spontaneous and induced groups $^{\Psi}$ P-value calculated by chi-square test, $^{\S}$P-value calculated by independent sample t-test test

In the present study, most patients (61% of total patients) were aged 21-25 years. There was no statistically significant difference in age in both study groups (Table 1). In the present study, 42% of nulliparous women had spontaneous labour, whereas 43% were induced. There was no statistically significant difference in gestational age and parity between both the study groups (P-value- 0.663).

As shown in table 2, Caesarean section rate was more in the induced group (29%) than the spontaneous group (15%). Caesarean delivery rate was significantly higher for nulliparous or multiparous women in the induced group (P-value 0.02). Most common method of induction used in our setup was with prostaglandin $E_2$ gel (53%) followed by oxytocin infusion (29%) and artificial rupture of membrane (18%). As shown in Table 2, women in the spontaneous group required significantly more augmentation with oxytocin (40%) than the induced group (24%). Fetal distress was the common indication among both groups, leading to caesarean delivery. There was no significant difference in the duration of the first and second stages of labour between both groups.

**Table 3 Maternal complications between study groups (n=200)**

| Maternal complications | **Spontaneous group (n=100)** | **Induced group (n=100)** | **P-value** |
|---|---|---|---|
| **Antenatal complications** | | | |
| No complications | 28 (28%) | 18 (18%) | 0.09$^{\Psi}$ |
| Complication present | 72 (72%) | 82 (82%) | |
| •Mild PIH* | 17 (17%) | 18 (18%) | |
| •GDM** | 2 (2%) | 1 (1%) | |
| •PROM*** | 16 (16%) | 24 (24%) | |
| •Moderate Anemia | 15 (15%) | 12 (12%) | |
| •Rh-negative | 10 (10%) | 12 (12%) | |
| •Oligohydramnios | 13 (13%) | 17 (17%) | |
| **Intrapartum complications** | | | |
| No complications | 88 (88%) | 78 (78%) | 0.06$^{\Psi}$ |
| Complication present | 12 (12%) | 22 (22%) | |
| •Vomiting | 11 (11%) | 20 (20%) | |
| •Fever | 1 (1%) | 1 (1%) | |
| •Hyperstimulation | 0 (%) | 1 (1%) | |
| **Postpartum haemorrhage** | | | |
| No complications | 98 (98%) | 97 (97%) | 0.65$^{\Psi}$ |
| Complication present | 02 (2%) | 03 (3%) | |
| •Atonic uterus | 1 (50%) | 1 (33%) | |
| •Traumatic uterus | 1 (50%) | 2 (67%) | |

*PIH-Pregnancy Induced Hypertension. **GDM-Gestational Diabetes Mellitus, ***PROM-Premature rupture of membrane
$^{\Psi}$P-value calculated by chi-square test

As shown in table 3, proportion of antenatal complications were similar in the induced group (82%) and the spontaneous group (72%). In the present study, 12% of the women in the spontaneous group and 22% in the induced group had intrapartum complications. Minimal post-partum complications were observed in both groups (2% of the women in the spontaneous group and 3% women in the induced group).

**Table 4 Neonatal outcomes between study groups (n=200)**

| Variables | Spontaneous group (n=100) | Induced group (n=100) | P-value |
|---|---|---|---|
| **Birth weight** | 2.826 ± 0.418 | 2.868 ± 0.386 | 0.33[§] |
| **APGAR score of babies** | | | |
| 7 – 10 | 92 (92%) | 86 (86%) | 0.66[ψ] |
| 4 – 6 | 7 (7%) | 13 (13%) | |
| 0 - 3 | 1 (1%) | 1 (1%) | |
| **NICU* admission** | | | |
| No | 74 (74%) | 65 (65%) | 0.17[ψ] |
| Yes | 26 (26%) | 35 (35%) | |
| **Reasons for NICU* admission** | | | |
| Meconium aspiration syndrome | 2 (7.7%) | 3 (8.57%) | 0.23[ψ] |
| Respiratory distress | 8 (30.77%) | 14 (40%) | |
| Hyperbilirubinemia | 16 (61.53%) | 18 (51.43%) | |

*NICU -Neonatal Intensive Care Unit, [ψ] P-valuecalculated by chi square test, [§]P-value calculated by independent sample t-test test

As per Table 4, there was no significant difference in the mean birth weight of the baby between both groups (2.82 kg vs 2.86 kg). APGAR scores (7-10) at 10 minutes were reported in 92% of newborns in the spontaneous group and 86% in the induced group. NICU admission rates were 26% and 35% in the spontaneous and induced groups, respectively. Hyperbilirubinemia as a reason for NICU admission was reported in 61.53% from the spontaneous group and 51.43% babies from the induced group. No mortality was observed among mothers or newborns in the present study.

## Discussion

Management of pregnancy beyond the expected delivery date (EDD) is a cause of worry because of greater risk to the mother and baby. One of the dangers is a higher risk of oligohydramnios due to deteriorating placental function. Other risks include umbilical cord compression, which can result in temporary or permanent reduced oxygenation of the foetus, non-progressive labour, instrumental delivery and an increased chance of caesarean birth. Choosing between elective induction of labour between 39 and 41 weeks and expectant management to wait for spontaneous commencement of labour has always been a contentious issue, weighing the risks of induction against the risks of postdate pregnancy.

Age, parity, and gestational age of research participants did not vary statistically significantly between the groups in this study, indicating that the two groups were statistically equivalent in all respects. In the present study, mean age of women undergoing spontaneous labour was 24.36 years while that in the induced group was 23.99 years. Both the induced and spontaneous group populations in this research were similar in terms of maternal age. These findings were in agreement in the study done by Leighton BL et al.,[8] Chabbra et al.,[9] and Babu S et al.[10]

In this study, induced group had a significantly higher caesarean section rate than the spontaneous group (29 % vs. 15%). The finding was in line with Leighton BL et al.,[8] who reported that women who underwent induction between 38 and 42 weeks had a considerably greater incidence of caesarean section than women who experienced spontaneous labour. Our findings contrast those of Chabbra et al.,[9] who observed a lower rate of caesarean section in the induced labour group compared to the spontaneous labour group (15.55% vs 24.78 %). The possible reason for the different results may be due to different study settings.

Induced group had a considerably greater caesarean section rate than the spontaneous group among nulliparous women (35.72 vs. 21.95 %). This conclusion matched that of Babu S et al.,[10] who found that the caesarean section rate among nulliparous women was considerably greater in the induction of labour group than in the spontaneous labour group (31% vs 12%). Parity and gestational age are the factors that cause discrepancies in the results across the studies.

In the present study, the most common cause of caesarean section was fetal distress followed by non-progress of labour in both groups. In the study done by Babu S et al.,[10] most common indication of caesarean section was fetal distress. Fetal distress is caused by intrapartum hypoxia, the pathogenesis of which is poorly understood. Timely diagnosis of fetal distress is a must for clinicians for decision making.

In the present study, maternal intrapartum complications were seen among 12% of the spontaneous group and 22% of the induced group. In the study done by Babu S et al.,[10] the maternal intrapartum complications were observed in 3.5% women in the induced group and 5% in the spontaneous group. Sampling and geographical variability can account for this difference.

In the present study, a similar proportion of pregnancy-induced hypertension was seen in both groups. In a retrospective study, Throrton et al.[11] found that induction of labour (rather than spontaneous labour) results in lower rates of vaginal birth in women with preeclampsia or superimposed preeclampsia than spontaneous labour without hypertension during pregnancy. In pregnancies between 36 and 41 weeks of gestation with gestational hypertension or mild preeclampsia, Bernardes et al.[12] found that induction of labour is not associated with increased rates of caesarean section or adverse neonatal outcome when compared to expected management, even in patients with an unripe cervix.

In this research, percentages of premature rupture of the membrane were higher in induced labour. PROM is a frequent symptom of labour induction. In PROM, early induction minimises the latency period. The most widely employed drugs for this purpose are oxytocin and prostaglandins, and their effectiveness is determined by the state of the cervix at the time of induction of labour.

In the present study, women in the spontaneous group require significantly more augmentation with oxytocin (40%) than the induced group (24%). Contrast results were found in the study done by Yadav K et al.[13] where 42% of patients in the spontaneous group and 78% in the induced group required oxytocin augmentation. The present study enrolled nulliparous and multiparous women while Yadav K et al.[13] enrolled only nulliparous women. Induced patients typically need augmentation, therefore adequate labour monitoring and dosage titration are necessary.[13]

In the present study, there was no significant difference in the duration of first stage and second stage of labour between both groups. This is comparable with the findings of Macer et al.,[14] where duration of labour in the first and second stage in both groups were comparable. The present study's finding contradicts the findings of Vahratianet A et al.,[15] who concluded that there is a statistically significant prolongation of the first and second stage of labour in both primipara and multipara in the induced group. 13% of women in the spontaneous labour and 22% in induced labour suffered intrapartum problems in the current study. In the study by Babu S et al.,[10] incidence of maternal intrapartum problems was 3.5% in the induced group and 5% in the spontaneous group. The difference may be due to different study locations and sampling variabilities. The rates of intrapartum complication were not significantly different across the groups.

Post-partum complications (atonic and traumatic PPH) were seen among 2% of the women in the spontaneous group and 3% of women in the induced group. Similar findings were reported by Yadav K et al.[13] in which the most common post-partum complication was atonic postpartum haemorrhage. Suchika G et al.[16] also reported a similar incidence of post-partum haemorrhage between both groups.

In the present study, mean birth weight among the spontaneous and induced groups was 2.82 kg and 2.87 kg, respectively. The present study showed no significant association between induction and birth weight. This finding was in agreement with the study done by Guerra GV et al.,[17] where the mean birth weight among the induced group and spontaneous onset group was 3.25 kg each. There was no significant difference in APGAR scoring between both groups. The studies done by Yadav K et al.,[11]

Suchika G et al.[16] and Patel O et al.[18] also reported that mean APGAR scores were comparable in two groups. It suggested no difference in perinatal mortality between study groups.
Admissions to NICU were almost equal in the induced group and spontaneous labour group, the reasons being Meconium aspiration syndrome, Respiratory distress and hyperbilirubinemia. There were 35% admissions in the induced group and 26% in the spontaneous group, similar to a study by Stock SJ et al. [19] in which admissions to NICU were increased in elective induction of labour (8%) compared with 7.3% in expectant management. The discrepancies in the results may be due to difference in the study setting and sample size. The most common cause of admission was hyperbilirubinemia which was almost similar in both groups. This finding is in agreement with the study by Stock SJ et al.[19] and Beazley etal.[20]

## Conclusion

The present study concludes that, for nulliparous and multiparous women, labour induction increases the chance of surgical delivery. Maternal complications are increased with induction of labour but these are not fatal. Also, induction does not affect morbidity in newborns. Inductions are safe in carefully selected scenarios and may be used as a therapeutic option when immediate delivery benefits outweigh the risks of pregnancy extension.

## References


1. Liao JB, Buhimschi CS, Norwitz ER. Normal labour: mechanism and duration. ObstetGynecolClin North Am. 2005 Jun;32(2):145-64, vii. doi: 10.1016/j.ogc.2005.01.001. PMID: 15899352.
2. World Health Organization. WHO recommendations for induction of labour. World Health Organization2011.Citedthroughhttp://apps.who.int/iris/bitstream/handle/10665/44531/9789241501156_eng.pdf;jsessionid=4564134D5229133AD0805062E8F3BB62?sequence=1 Accessed on 23rd October 2021
3. Galal M, Symonds I, Murray H, Petraglia F, Smith R. Post-term pregnancy. Facts Views Vis Obgyn. 2012;4(3):175-87. PMID: 24753906; PMCID: PMC3991404.
4. Sultana R, Begum K, Sultana N, Sultana N, Munmun SA, Ara R, Akter S. Induction of labour in prolonged pregnancy and its outcome. Medicine Today. 2014;26(2):100-3.
5. Middleton P, Shepherd E, Crowther CA. Induction of labour for improving birth outcomes for women at or beyond term. Cochrane Database Syst Rev. 2018 May 9;5(5): CD004945. doi: 10.1002/14651858.CD004945.pub4. Update in: Cochrane Database Syst Rev. 2020 Jul 15;7:CD004945. PMID: 29741208; PMCID: PMC6494436.
6. Leduc D, Biringer A, Lee L, Dy J; CLINICAL PRACTICE OBSTETRICS COMMITTEE; SPECIAL CONTRIBUTORS. Induction of labour. J ObstetGynaecol Can. 2013 Sep;35(9):840-857. English, French. doi: 10.1016/S1701-2163(15)30842-2. PMID: 24099451.
7. Amis D. Healthy Birth Practice #1: Let Labor Begin on Its Own. J Perinat Educ. 2019 Apr 1;28(2):68-80. doi: 10.1891/1058-1243.28.2.68. PMID: 31118543; PMCID: PMC6503903.
8. Leighton BL, Halpern SH. The effects of epidural analgesia on labour, maternal, and neonatal outcomes: a systematic review. Am J Obstet Gynecol. 2002 May;186(5 Suppl Nature): S69-77. doi: 10.1067/mob.2002.121813. PMID: 12011873.
9. Chabbra S, Dargan R, NasareM.Postdate pregnancies: Management options. J ObstetGynecol India. 2007;57:307-9
10. Babu S. Elective induction versus spontaneous labour at term: a prospective study of outcome and complications. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2017 Nov 1;6(11):4899-908.
11. Thornton CE, Dahlen HG, Hennessy A. Does induction of labour in nulliparous hypertensive women result in vaginal birth?–A descriptive study utilising birth registry data. Pregnancy Hypertension. 2018 Apr 1;12:16-22.
12. Bernardes TP, Broekhuijsen K, Koopmans CM, Boers KE, Van Wyk L, Tajik P, Van Pampus MG, Scherjon SA, Mol BW, Franssen MT, Van Den Berg PP. Caesarean section rates and adverse neonatal outcomes after induction of labour versus expectant management in women with an unripe cervix: a

secondary analysis of the HYPITAT and DIGITAT trials. BJOG: An International Journal of Obstetrics & Gynaecology. 2016 Aug;123(9):1501-8.

13. Yadav K, Ranga M, Nama A. Comparative study of induced and spontaneous labour in nulliparous women using modified WHO partograph. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020 May 1;9(5):2014-20.
14. Macer JA, Macer CL, Chan LS. Elective induction versus spontaneous labour: a retrospective study of complications and outcome. Am J Obstet Gynecol. 1992 Jun;166(6 Pt 1):1690-6; discussion 1696-7.
15. Vahratian A, Zhang J, Troendle JF, Sciscione AC, Hoffman MK. Labour progression and risk of cesarean delivery in electively induced nulliparas. Obstet Gynecol. 2005 Apr;105(4):698-704. doi: 10.1097/01.AOG.0000157436.68847.3b. PMID: 15802393.
16. Suchika G, Usha S, Premlata M, Madhu M. To study the fetomaternal outcome and progress of labour among induced versus spontaneous labour in nulliparous women (using modified WHO partograph). Sch J App Med Sci. 2014;2:1577-80.
17. Guerra GV, Cecatti JG, Souza JP, Faúndes A, Morais SS, Gülmezoglu AM, Passini Jr R, Parpinelli MA, Carroli G. Elective induction versus spontaneous labour in Latin America. Bulletin of the World Health Organization. 2011;89:657-65.
18. Patel O, Pradhan S, Naik B. Comparative study of labour progress and delivery outcome among induced versus spontaneous labour in nulliparous women using modified who partograph. Journal of Evolution of Medical and Dental Sciences. 2017 Mar 20;6(23):1844-50.
19. Stock SJ, Ferguson E, Duffy A, Ford I, Chalmers J, Norman JE. Outcomes of elective induction of labour compared with expectant management: a population-based study. BMJ. 2012 May 10;344:e2838. doi: 10.1136/BMJ.e2838. PMID: 22577197; PMCID: PMC3349781.
20. Beazley JM, Weekes AR. Neonatal hyperbilirubinaemia following the use of prostaglandin E2 in labour. Br J ObstetGynaecol. 1976 Jan;83(1):62-67. doi: 10.1111/j.1471-0528.1976.tb00732.x. PMID: 766823.