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Induction of Labor in a Contemporary Obstetric Cohort

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Abstract

Objective—To describe details of labor induction, including precursors and methods, and associated vaginal delivery rates.

Study Design—A retrospective cohort study of 208,695 electronic medical records from 19 hospitals across the United States, 2002–2008.

Results—Induction occurred in 42.9% of nulliparas and 31.8% of multiparas and elective or no recorded indication for induction at term occurred in 35.5% and 44.1%, respectively. Elective induction at term in multiparas was highly successful (vaginal delivery 97%) compared to nulliparas (76.2%). For all precursors, cesarean delivery was more common in nulliparas in the latent compared to active phase of labor. Regardless of method, vaginal delivery rates were higher with a ripe versus unripe cervix, particularly for multiparas (86.6 – 100%).

Conclusions—Induction of labor was a common obstetric intervention. Selecting appropriate candidates and waiting longer for labor to progress into the active phase would make an impact on decreasing the national cesarean delivery rate.

Keywords

indication for induction; induction and cesarean; labor induction; method of induction

INTRODUCTION

The induction rate in the United States has more than doubled from 9.5% of all deliveries in 1990 to 22.5% in 2006.^{1, 2} The increasing induction rate may be due in part to increased rates of complications such as gestational diabetes and preeclampsia as a result of increasing maternal age and body mass indices (BMI) in the current obstetric population.^{3, 4} Another

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key contributor, however, has been a rise in elective induction, when there is no medical or obstetrical indication for delivery.⁵ Induction of labor has been implicated in an increased risk of cesarean delivery in some studies, while other observational studies and small randomized controlled trials have demonstrated a decreased risk of cesarean and potentially improved neonatal outcomes with elective delivery.^{6, 7} Elective inductions may be preferentially performed in healthy pregnancies and for women who have a more favorable Bishop score, factors that typically translate to better maternal and neonatal outcomes. Yet the evidence of the benefits of elective induction before 41 0/7 weeks of gestation is insufficient, since many of these studies have been limited by methodological deficiencies.⁷ These discrepant results also suggest that the success of induction and maternal and perinatal outcomes may differ depending on the indication for induction, as well as on cervical readiness. The purpose of this study is to describe in detail the maternal and obstetrical characteristics of induction of labor in a recent obstetrical cohort in the United States, including precursors and methods for induction of labor and associated vaginal delivery rates.

MATERIALS AND METHODS

The Consortium on Safe Labor was a study conducted by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, National Institutes of Health, and has been described in detail elsewhere.⁸ In brief, this was a retrospective cohort study involving 228,668 deliveries between 2002 and 2008 from 12 clinical centers and 19 hospitals representing nine American Congress of Obstetricians and Gynecologists (ACOG) U.S. districts. Institutional Review Board approval was obtained by all participating institutions. The population was then standardized by assigning a weight to each subject using ACOG district, maternal race/ethnicity, parity and plurality based on 2004 National Natality data.^{8, 9} To limit over-contribution by women who had multiple pregnancies during the study period, we included the first pregnancy if a woman had more than one pregnancy in the present study.

Induction of labor was a predefined variable when either the patient's electronic medical record indicated that there was an induction and/or a method or start time for induction was recorded in the patient's chart. There was a separate variable for labor augmentation. We defined attempts at vaginal delivery to include all women with at least two vaginal examinations in the labor progression database. We established three categories of precursors for induction: "indicated," "elective," and "no recorded indication." The indication for induction was used to identify the precursors for delivery and classified using the following hierarchy. First, women with premature rupture of the membranes were always classified as "PROM." Thus, if a woman undergoing induction of labor had both premature rupture of the membranes and another indication, she was only counted once in the "PROM" category. Second, we supplemented the indication for induction with all potential maternal, fetal or obstetric complications of pregnancy, which were then included in the "indicated" category. For example if a woman had an induction and no indication was recorded but the pregnancy was complicated by preeclampsia, then she was included in the "indicated" precursor "preeclampsia." A woman could have more than one pregnancy condition in the "indicated" category. We also included in the "indicated" category those women who were admitted to labor and delivery for an unspecified "fetal" or "maternal" reason. Third, if a site indicated that the induction was elective, no other indications for induction were provided, and there were no other obstetric, fetal or maternal conditions complicating the pregnancy, then the precursor for induction was designated "elective." If a delivery indication was noted as post dates or postterm with no other indications listed but before 41 weeks of gestation, these were also coded as "elective." Finally, the "no recorded indication" category encompassed all inductions as identified by the site with no other

obstetric, fetal or maternal conditions of the pregnancy, including if no reason for induction was provided. Method of labor induction included all methods for cervical ripening and induction with multiple values was allowed.

Demographic data were summarized. We then investigated the precursors among women undergoing induction of labor at 24 – 41 weeks, which amounts to a weighted sample size of 1,323,407. One site did not provide indications for induction and was not included in the precursor analysis (Table 2), leaving a weighted sample size of 1,281,193.

For the next analysis, the number and percentage of women with singleton gestations and vertex presentation ($n = 1,231,662$ who underwent induction of labor) were calculated for each method of induction and stratified by both the need for cervical ripening and preterm (24 – 36 weeks of gestation) versus term (37 – 41 weeks of gestation). Kaplan Meier curves were created for nulliparous women with a singleton gestation, vertex presentation and show the cervical dilation reached at the time of intrapartum cesarean delivery. These curves are stratified by the major precursor categories and by preterm (24 to < 37 weeks) and term (37 to < 42 weeks). Four hospitals did not report methods of induction, and two hospitals did not report cervical dilation at admission, leaving cases from 13 of the 19 hospitals available for analysis ($n = 986,009$). An additional 157,768 of the inductions did not have a method of induction reported and were excluded from the analysis. Of the remaining cases ($n = 828,241$), only 146,793 (17.7%) had an original Bishop score available with all five components reported, while 703,105 (84.9%) had information available on cervical dilation, effacement and station. Therefore, as previously described elsewhere, we used a simplified Bishop score, comprised of dilation, effacement and station only, to determine the cervical readiness (ripe versus unripe) for induction.¹⁰ We defined an unripe cervix as a simplified Bishop score ≤ 4 because of similar sensitivity and specificity to the original Bishop score ≤ 6 , the definition of an unfavorable cervix.¹¹ We compared maternal, obstetrical and hospital characteristics between those with missing information and those where either the method of induction or cervical information was known. Women with a missing method of induction were slightly more likely to have a ripe cervix (21.8% versus 18.1%), but slightly more likely to deliver by cesarean (22.9% versus 20.1%). Cesarean delivery was also higher in women with a missing simplified Bishop score (25.8% versus 19.8%).

Given that this is a descriptive analysis with very large sample size, no significance testing was performed. All analyses were performed using SAS version 9.2 (SAS Institute, Inc, Cary, NC).

RESULTS

The prevalence of induction of labor by maternal and obstetric characteristics is presented in Table 1. Overall, induction was common, occurring in 42.9% of nulliparous women and 31.8% of multiparous women. Among women attempting vaginal delivery, induction was more prevalent with increasing maternal age, those with higher BMIs, and postdate pregnancies. The rate of induction varied modestly by race/ethnicity, ranging from 41.6% among non-Hispanic whites to 46.7% among Hispanic nulliparas, with multiracial/other/unknown appreciably lower rate (35.3%), and ranging in multiparas from 28.0% for multiracial/other/unknown to 33.8% among non-Hispanic whites. Induction in nulliparas varied substantially by hospital type, occurring most frequently in university-affiliated teaching hospitals (47.6%), followed by teaching community hospitals (36.7%), then non-teaching community hospitals (27.4). Rates by hospital type for multiparas were more similar (30.0 – 37.4%). The prevalence of induction in multiparous women with a previous uterine scar was low (8.3%). Induction was less common at gestational ages below 34

weeks, and had the highest prevalence at 41 weeks of gestation (63.4% in nulliparas and 50.1% in multiparas).

Precursors of Induction

Indicated precursors of induction were the largest category of precursors in singleton gestations, regardless of gestational age or parity (Table 2). The most common indicated precursor for preterm induction in singleton gestations was hypertensive disease (42.6% in nulliparas and 31.6% in multiparas), followed by fetal (28.7% in nulliparas and 27.3% in multiparas) and maternal conditions (24.7% and 27.1%, respectively). At term, the prevalence of indicated precursors was reversed, with fetal (20.6% in nulliparas and 12.8% in multiparas) and maternal conditions (14.8% in nulliparas and 16.6% in multiparas) more common than hypertensive disease (14.2% in nulliparas and 8.7% in multiparas). Inductions were elective in 1.2% of preterm nulliparas and 2.3% of preterm multiparas, compared to 15.6% of nulliparas and 25.4% multiparas at term. However, 9.9% of all preterm inductions were classified as elective or no recorded indication. Approximately 95% of pregnancies with the unknown precursors for induction delivered at 37 weeks of gestation or later; 4.3% were at late preterm; and 0.9% were prior to 34 weeks of gestation. Elective induction was the most common individual precursor in multiparas at term.

Success of Vaginal Delivery by Precursor for Induction

Results for delivery outcomes are also presented in Table 2. Among nulliparous women, indicated induction was associated with the lowest vaginal delivery rates (62.8% preterm and 63.7% term). At term, elective induction in multiparas was associated with a high vaginal delivery rate of 97% vs. 76.2% for nulliparas. Vaginal delivery rates for elective induction were similar to those with no recorded indication. Among nulliparous women, both preterm and term, the proportions still in labor at each cervical dilation were highest for elective induction, those with no recorded indication and ROM (Figure a. Preterm and b. Term). With respect to precursors of preterm delivery, the largest percentage of cesarean deliveries in the 1st stage of labor were performed prior to 6cm dilation, especially for fetal indications and preeclampsia, followed by diabetes (Figure a). The rate of cesarean delivery after 6 cm decreased modestly in active labor. At term, the largest percentages of cesarean deliveries in the 1st stage of labor were also performed prior to 6cm dilation, and occurred more often for fetal indications, diabetes, postdates and preeclampsia compared to those with elective induction, no recorded indication or ROM.

Method of Induction and Success of Vaginal Delivery

Oxytocin was the most common method of induction, regardless of gestational age, parity or cervical ripeness (Table 3). Artificial rupture of membranes was the second-most common method of induction for all categories. Overall, misoprostol and PGE2 were used more commonly than mechanical methods for an unripe cervix, whereas mechanical method use was similar at term compared to preterm in nulliparas (5.1% versus 6.2%), but not in multiparas (2.9% versus 4.9%). Regardless of method, vaginal delivery rates were high for multiparas with a ripe cervix both preterm (94.6% – 100.0%) and term (86.6 – 100.0%). Both nulliparas and multiparas with an unripe cervix preterm and at term had lower vaginal delivery rates, compared to those cases with a ripe cervix, for each method of induction.

COMMENT

This study describes maternal and obstetric characteristics of induction of labor in a large, modern cohort of parturients across the United States. Induction of labor was a common obstetric intervention, occurring in 47.6% of nulliparous and 41.0% of multiparous women attempting vaginal delivery. Induction was more prevalent among women who were older

and with higher BMIs, but did not vary much across race/ethnicity. Hypertensive disease, maternal conditions including diabetes, and fetal conditions were the most common indicated precursors for induction. While precursors for induction differed by gestational age and parity, approximately 90% of preterm inductions were for medical and obstetrical complications, whereas elective induction and induction with no recorded indication occurred in about one third of nulliparas and almost half of multiparas at term.

Successful vaginal delivery rates varied by precursors and also depended on gestational age. For all precursors, cesarean delivery in the 1st stage of labor was more common in nulliparas prior to 6 cm. In a previous study of women who presented in spontaneous labor from this same original cohort, active labor did not start until 6 cm dilation.¹² This finding is not surprising since there is no agreed upon definition of “failed labor induction”.¹³ Indicated precursors for induction, including preeclampsia, diabetes and fetal indications, were associated with higher cesarean delivery rates, compared to women undergoing elective induction or with ROM or no recorded indication, at every cm of dilation prior to 6 cm of dilation, indicating that inductions were more likely to fail during the latent phase in complicated pregnancies. This result may be due to a combination of worsening maternal status and/or fetal intolerance of labor, as well as perceived need for a more expedited delivery. It is worth noting that among nulliparous women undergoing induction at term for elective reasons or without a recorded indication, suggestive of healthy pregnancies, 16.0% and 12.3%, respectively underwent cesarean delivery in the latent phase of labor.

Oxytocin alone was the most common method of induction, which is consistent with previous studies.¹⁴ Vaginal delivery rates were higher for women with a ripe versus an unripe cervix for all methods of induction. A Cochrane Review found prostaglandins to be associated with higher successful vaginal delivery within 24 hours, as compared to oxytocin; however, most studies did not account for cervical ripeness.¹⁴ Mechanical methods were associated with higher vaginal delivery rates, compared to oxytocin alone, which is consistent with the literature.¹⁵ Prostaglandins and mechanical cervical ripening were associated with similar vaginal delivery rates in nulliparas, whereas the existing evidence has been insufficient to determine whether prostaglandins or mechanical cervical ripening is more effective.¹⁵ At term, mechanical ripening together with prostaglandin (either misoprostol and/or prostaglandin E2) was generally associated with a higher successful vaginal delivery rate, compared to other methods. It may be that the combination of multiple methods of induction is superior. Yet this result could also reflect the clinician’s commitment to a successful induction, given the willingness to try multiple methods prior to proceeding with cesarean delivery. We did not have information, however, on whether these methods were used simultaneously or in succession.

Our study is limited because the indications for induction were not always provided. We supplemented indications with information on any other medical, obstetrical or fetal conditions, even though those may not have been the actual indication for delivery. Therefore, the true incidence of indicated precursors was likely less than we have reported. Some of the cases with no recorded indication may be due to underreporting of maternal or fetal conditions. At the same time, given the large number of variables on which data were collected, as well as our conservative effort to include all possible conditions, a certain proportion of the deliveries with an unknown precursor were likely elective. Also, the fact that the majority of the unknown precursors were at term and the high successful vaginal delivery rate in these cases, which was greater than or similar to the rates observed for elective indications or rupture of membranes, provides further support that those with no recorded indication were more likely to be cases of elective induction. Our study is further limited by instances of missing methods of induction, though it is likely that they are missing at random since the percentage of indicated precursors were the same whether the

method of induction was recorded or not. It was also likely that the recording of some versus all three components of the simplified Bishop score was based on clinicians' preferences, rather than inherent differences about women undergoing induction. While the results may not be applicable to the entire U.S. population, the major strengths of our study are the large sample size and the ability to provide a comprehensive description of induction of labor in a modern obstetrical cohort across the U.S.

In conclusion, we found that induction of labor in a modern obstetric cohort occurred in almost half of nulliparous women and four out of 10 multiparous women attempting vaginal delivery. Precursors differed by gestational age and parity, and vaginal delivery was more successful in uncomplicated pregnancies. Approximately one out of ten preterm inductions did not have an indication for induction or another pregnancy condition, despite the evidence that neonatal morbidity and mortality decreases with each gestational week until 39 weeks of gestation.^{16, 17} Elective induction and those with no recorded indication were common at term, comprising almost one third of nulliparous and almost half of multiparous inductions, with a high successful vaginal delivery rate, in multiparas regardless of Bishop score. Considering the findings that nulliparous women at term with induction for elective reasons or with no recorded indication had an associated 24% rate of cesarean delivery with the majority being performed in latent labor, selecting appropriate candidates, avoiding elective induction in nulliparas, especially with an unripe cervix, and waiting longer for labor to progress into the active phase (beyond 6 cm) would make an impact on decreasing the national cesarean delivery rate.

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Figure 1. Cervical dilation at cesarean delivery

a. Preterm, 24 to < 37 weeks of gestation

b. Term, 37 – 41 weeks of gestation.

Figure legend. Cervical dilation at intrapartum cesarean delivery among nulliparous women with singleton gestations undergoing induction of labor by precursor category.

Table 1

Prevalence of induction of labor (weighted) by parity.

Variable	Nulliparous			Multiparous		
	Proportion of the population, % n = 1,612,035	Prevalence in women undergoing Induction (42.9%), %	Prevalence in women attempting vaginal delivery (47.6%), %	Proportion of the population, % n = 2,033,140	Prevalence in women undergoing Induction (31.8%), %	Prevalence in women attempting vaginal delivery (41.0%), %
Maternal age – years						
<18	6.5	37.2	38.9	0.4	23.4	26.3
18 – 34	83.0	43.3	47.4	77.8	31.9	40.0
35 +	10.4	43.9	55.7	21.7	31.8	45.6
Missing	0.1	22.6	34.5	0.1	14.2	20.3
Race/ethnicity						
Non-Hispanic white	58.7	41.6	46.6	54.3	33.8	43.7
Non-Hispanic black	13.6	44.1	48.1	14.6	29.1	37.9
Hispanic	20.6	46.7	50.8	25.0	29.7	38.0
Asian/Pacific Islanders	3.8	44.4	48.8	2.9	30.4	38.6
Other/Unknown	3.3	35.3	39.3	3.2	28.0	35.9
Health insurance						
Private	55.8	41.0	45.9	51.2	32.9	42.7
Public	31.1	39.7	43.2	34.8	27.4	36.0
Self-pay	1.2	47.1	51.0	1.6	28.9	35.4
Other/unknown	11.9	60.0	66.2	12.4	39.8	48.2
BMI at delivery – kg/m ²						
< 25.0	12.9	38.0	42.1	10.3	29.3	35.3
25.0 – 29.9	32.7	42.2	46.2	29.7	32.4	39.9
30.0 – 34.9	21.6	46.5	51.8	23.1	33.7	44.2
35.0+	15.0	53.5	61.0	18.5	35.1	51.3
Unknown	17.9	34.7	38.1	18.4	26.5	33.7

Variable	Nulliparous			Multiparous		
	Proportion of the population, % n = 1,612,035	Prevalence in women undergoing Induction (42.9%), %	Prevalence in women attempting vaginal delivery (47.6%), %	Proportion of the population, % n = 2,033,140	Prevalence in women undergoing Induction (31.8%), %	Prevalence in women attempting vaginal delivery (41.0%), %
Number of fetuses						
Singleton	99.0	43.2	47.6	97.7	32.2	41.2
Multiple	1.0	18.1	36.1	2.3	15.6	31.6
Previous uterine scar *	0.6	9.5	49.0	25.0	8.3	28.8
Gestational age at delivery - weeks						
< 34	5.1	23.4	33.2	4.9	15.6	27.3
34 – 36	8.2	41.6	49.9	9.5	25.6	36.8
37	9.0	43.0	49.2	10.9	30.2	40.2
38	18.5	41.9	47.3	22.7	29.6	40.5
39	26.7	39.8	43.7	30.6	34.3	44.6
40	23.4	44.0	46.0	16.3	33.7	36.9
41+	9.2	63.4	65.0	5.1	50.1	53.5
Pregnancy complications						
Diabetes	4.9	52.4	64.0	6.5	35.9	56.3
Hypertensive disorder	10.6	68.1	78.6	7.2	47.1	69.3
Fetal anomaly **	7.9	37.4	47.4	7.6	26.6	40.1
Hospital type						
University affiliated teaching hospital	60.0	47.6	53.6	60.5	32.5	43.1
Teaching community hospital	36.8	36.7	39.6	35.7	30.0	37.3
Non-teaching community hospital	3.2	27.4	29.2	3.8	37.4	44.9

Hypertensive disorder = chronic hypertension, preeclampsia, superimposed preeclampsia, eclampsia, gestational hypertension, unspecified

Prevalence of induction in women attempting vaginal delivery = denominator excludes prelabor cesarean delivery

Diabetes = pregestational or gestational diabetes

* Previous uterine scar includes previous myomectomy in nulliparous women.

^{##} Fetal anomaly for multiple gestations is per unit of pregnancy.

Table 2

Precursors for induction of labor by gestational age with rate of vaginal delivery in singleton gestations.

Precursor	Preterm 24 – 36 weeks		Term 37 – 41 weeks	
	Nulliparous n = 69,796 % With Precursor	Multiparous n = 58,432 % With Precursor	Nulliparous n = 595,585 % With Precursor	Multiparous n = 557,380 % With Precursor
Any Precursor *				
PROM	22.3	22.0	10.5	6.3
Chorioamnionitis	2.6	2.3	1.2	0.3
Decidual hemorrhage / abruption	3.7	5.4	1.5	1.9
Hypertensive disease	42.6	31.6	14.2	8.7
Gestational Hypertension	13.3	6.9	4.2	2.0
Preeclampsia	14.1	7.4	4.5	2.0
Superimposed preeclampsia	6.3	6.3	1.1	0.9
Eclampsia	1.2	0.4	0.03	0.1
Chronic hypertension	2.3	2.4	1.1	1.3
Unspecified	5.3	8.3	3.4	2.5
Maternal condition †	24.7	27.1	14.8	16.6
Diabetes	11.1	11.9	5.6	7.1
Fetal anomaly	15.6	11.3	6.0	5.7
Antepartum stillbirth	4.6	5.6	0.2	0.7
Suspected fetal macrosomia	0.6	0.9	2.1	2.4
Fetal condition ‡	28.7	27.3	20.6	12.8
Maternal fever on admission	1.5	0.4	0.6	0.2
Admission for fetal reason, not otherwise specified ¶	0.2	0.6	0.6	0.6
Admission for maternal reason, not otherwise specified ¶	1.4	1.1	0.6	0.6
History of maternal/obstetrical condition §	0.03	0.4	0.02	0.6
History of fetal condition §	0.6	8.0	0.3	6.3
Postdates	0	0	11.4	6.4
Prior uterine scar	0.2	7.6	0.1	6.3
Total “Indicated” % Vaginal delivery	91.2 62.8	88.9 80.3	64.5 63.7	55.9 85.5
Elective % Vaginal delivery	1.2 92.3	2.3 95.8	15.6 76.2	25.4 97.0
No recorded indication % Vaginal delivery	7.6 83.4	8.8 93.4	19.9 75.9	18.7 94.6

PROM, premature rupture of the membranes.

* Categories for the “indicated” precursors can add up to > than the total indicated % because women could have more than one pregnancy condition.

† Maternal conditions are maternal medical problems. The percent of women with diabetes is listed.

‡ Fetal conditions included conditions such as intrauterine growth restriction, abnormal antenatal testing.

[§]History of maternal/obstetrical or fetal conditions included pregnancy complications in a prior pregnancy (e.g. “traumatic first delivery” or “history of fetal demise”, respectively).

[¶]Admission for fetal or maternal/obstetrical reasons were included only if there was no other pregnancy condition.

These are the only two indicated categories that are exclusive of other indications.

One site did not provide indications for induction and was excluded.

Table 3

Method of induction by cervical status in singleton gestations with rate of vaginal delivery.

Preterm 24 – 36 weeks % Method (% Vaginal Delivery)*									
	Nulliparous				Multiparous				
	Unripe n = 30,574		Ripe n = 4,900		Unripe n = 25,167		Ripe n = 3,662		
	% With Method	% Vaginal Delivery	% With Method	% Vaginal Delivery	% With Method	% Vaginal Delivery	% With Method	% Vaginal Delivery	
Misoprostol	6.3	60.7	4.3	93.3	4.3	83.9	1.7	100.0	
PGE2	8.2	38.6	3.1	77.0	6.6	65.2	0.7	100.0	
Misoprostol and PGE2	0.7	78.2	0	--	0.5	53.3	0	--	
Mechanical	1.1	38.3	0.9	100.0	0.9	70.5	0.4	100.0	
Mechanical and (Misoprostol or PGE2)	1.5	63.3	0.5	100.0	1.2	90.0	0.6	100.0	
Artificial ROM	11.2	74.1	6.6	89.5	12.1	89.5	19.2	94.6	
Oxytocin	71.0	62.8	84.6	90.9	74.4	85.3	77.6	96.2	

Term 37 – 41 weeks % Method (% Vaginal Delivery)*									
	Nulliparous				Multiparous				
	Unripe n = 252,638		Ripe n = 79,326		Unripe n = 235,470		Ripe n = 71,368		
	% With Method	% Vaginal Delivery	% With Method	% Vaginal Delivery	% With Method	% Vaginal Delivery	% With Method	% Vaginal Delivery	
Misoprostol	2.5	56.8	1.3	73.9	2.5	83.7	0.7	98.6	
PGE2	5.5	58.0	4.3	89.2	5.5	87.7	4.2	98.6	
Misoprostol and PGE2	0.4	57.9	0.1	100.0	0.4	85.7	0.1	86.6	
Mechanical	0.3	57.0	0.2	100.0	0.3	70.3	0.1	100.0	
Mechanical and (Misoprostol or PGE2)	1.5	71.1	1.6	91.8	1.5	94.9	1.2	97.2	
Artificial ROM	25.2	74.5	23.0	88.6	25.2	95.0	37.1	98.6	
Oxytocin	64.6	67.8	69.5	83.3	64.6	91.7	56.7	97.0	

Data are for singleton gestations with vertex presentation.

Unripe cervix defined as simplified Bishop score (dilation, effacement and station only) 4.

All methods could include oxytocin. The oxytocin category is exclusive (only oxytocin).

* Numbers for method of induction are % of women by parity and cervical ripeness who underwent that method (the row adds up to 100%). Numbers for vaginal delivery are the % of women who had a vaginal delivery who underwent induction per method by parity and cervical ripeness. For example, of the 6.3% nulliparous women with an unripe cervix who were induced with misoprostol, 60.7% had a vaginal delivery.

Data are weighted.