

Outcomes of Elective Labour Induction and Elective Caesarean Section in Low-risk Pregnancies Between 37 and 41 Weeks' Gestation

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Abstract

Objective: To compare maternal and neonatal outcomes after elective induction of labour and elective Caesarean section with outcomes after spontaneous labour in women with low-risk, full-term pregnancies.

Methods: We extracted birth data from 1996 to 2005 from an obstetrical database. Singleton pregnancies with vertex presentation, anatomically normal, appropriately grown fetuses, and no medical or surgical complications were included. Outcomes after elective induction of labour and elective Caesarean section were compared with the outcomes after spontaneous labour, using chi-square and Student *t* tests and logistic regression.

Results: A total of 9686 women met the study criteria (3475 nulliparous, 6211 multiparous). The incidence of unplanned Caesarean section was higher in nulliparous women undergoing elective induction than in those with spontaneous labour ($P < 0.001$). Postpartum complications were more common in nulliparous and multiparous women undergoing elective induction ($P < 0.001$ and $P < 0.01$, respectively) and multiparous women undergoing elective Caesarean section, ($P < 0.001$). Rates of triage in NICU were higher in nulliparous women undergoing elective Caesarean section ($P < 0.01$), and requirements for neonatal free-flow oxygen administration were higher in nulliparous and multiparous women undergoing elective Caesarean section ($P < 0.01$ for each). Unplanned Caesarean section was 2.7 times more likely in nulliparous women undergoing elective induction of labour (95% CI 1.74 to 4.28, $P < 0.001$) and was more common among nulliparous and multiparous women undergoing induction of labour and requiring cervical ripening ($P < 0.001$ and $P < 0.05$, respectively).

Key Words: Caesarean section, cervical ripening, elective, induction, low-risk pregnancies, maternal outcomes, neonatal outcomes, unplanned Caesarean section

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Conclusion: Elective induction leads to more unplanned Caesarean sections in nulliparous women and to increased postpartum complications for both nulliparous and multiparous women. Elective Caesarean section has increased maternal and neonatal risks.

Résumé

Objectif : Comparer les issues maternelles et néonatales à la suite du déclenchement de convenance du travail et de la césarienne de convenance aux issues constatées à la suite du travail spontané chez les femmes qui connaissent une grossesse menée à terme complet et n'étant exposée qu'à de faibles risques.

Méthodes : Nous avons utilisé des données sur la naissance (de 1996 à 2005) issues d'une base de données obstétricales. Les grossesses monofœtales en présentation du sommet, comptant un fœtus anatomiquement normal de taille appropriée et ne présentant aucune complication médicale ou chirurgicale ont été admises. Les issues constatées à la suite du déclenchement de convenance du travail et de la césarienne de convenance ont été comparées, au moyen d'une régression logistique et des tests chi carré et *t*, aux issues constatées à la suite du travail spontané.

Résultats : Au total, 9 686 femmes ont satisfait aux critères de l'étude (3 475 nullipares, 6 211 multipares). L'incidence de la césarienne non planifiée était plus élevée chez les nullipares subissant un déclenchement de convenance que chez celles qui connaissaient un travail spontané ($P < 0,001$). Les complications postpartum étaient plus courantes chez les nullipares et multipares subissant un déclenchement de convenance ($P < 0,001$ et $P < 0,01$, respectivement), ainsi que chez les multipares subissant une césarienne de convenance ($P < 0,001$). Les taux de triage en UNSI étaient accrus chez les nullipares subissant une césarienne de convenance ($P < 0,01$); de plus, la nécessité d'avoir recours à une oxygénothérapie néonatale à débit libre était accrue chez les nullipares et multipares subissant une césarienne de convenance ($P < 0,01$ pour les deux catégories). La tenue d'une césarienne non planifiée était 2,7 fois plus probable chez les nullipares subissant un déclenchement de convenance du travail (IC à 95 %, 1,74 – 4,28, $P < 0,001$) et était plus courante chez les nullipares et multipares subissant un déclenchement du travail et nécessitant une maturation du col ($P < 0,001$ et $P < 0,05$, respectivement).

Conclusion : Le déclenchement de convenance mène à un plus grand nombre de césariennes non planifiées chez les nullipares, ainsi qu'à une hausse des complications postpartum tant chez les nullipares que chez les multipares. La césarienne de convenance s'accompagne de risques accrus pour la mère et l'enfant.

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INTRODUCTION

Elective induction of labour and elective Caesarean section, or so-called obstetric conveniences, have become increasingly contentious topics over the past decade.^{1–9} With a growing demand for elective birthing options (i.e., in the absence of a medical indication), physicians are seeking empirical evidence with which to inform their patients about the risks and benefits of these procedures.^{10,11} Historically, induction of labour was performed when medically indicated to avoid conditions that could potentially harm mother or fetus. Indications for induction of labour have included (but are not limited to) preeclampsia/eclampsia and other hypertensive disorders, maternal diabetes mellitus, premature rupture of membranes, chorioamnionitis, intrauterine fetal growth restriction, isoimmunization, fetal demise, and post-term pregnancy. In recent years, it has become increasingly common for women with otherwise healthy pregnancies to request induction of labour for reasons of convenience. Rates of EI are difficult to estimate accurately, as they depend on what defines an elective induction. It is generally acknowledged, however, that EI rates are rising.^{8,9,12–18} Prysak and Castronova¹⁶ quoted an induction rate of 12.3%, and Rayburn and Zhang⁹ reported a rate of 19.4%. ECS is an even more recent phenomenon; it originated in the mid-1980s and began to gain popularity in the 1990s.² The reasons for requesting a Caesarean section in the absence of a medical indication are most commonly cited as tocophobia, wishing to avoid perineal injury and anal or urinary incontinence, wishing to avoid fetal injury, convenience, and control.² Like EI rates, the rates of ECS are increasing; the Canadian Institute for Health Information quoted the Canadian Caesarean section rate as 24% in 2002–2003, up from 17% in 1992–1993,¹⁹ and Caesarean section on request is said to account for 4% to 18% of all Caesarean sections performed.² Another study reported

that the ECS rate in Canada was 25% to 30% in 2003 (up from 5% to 7% in the early 1970s), making Caesarean section the most common surgical procedure in Canada.³ In Brazil these numbers are even higher.²⁰

The objective of this study was to compare the maternal and neonatal outcomes associated with births after EI and ECS at between 37 and 41 weeks' gestational age with the outcomes of births after spontaneous labour, in order to help guide clinicians' counselling of women about elective birth procedures.

MATERIALS AND METHODS

Data from all births at St Joseph's Health Care, London, Ontario are collected prospectively in computerized obstetrical and neonatal databases by dedicated research assistants. Using these databases, we conducted a retrospective study of women who met the following inclusion criteria: date of delivery between January 1, 1996, and December 31, 2005, singleton pregnancy, vertex presentation, between 37 and 41 weeks' gestational age at delivery, with no medical or surgical risk factors or complications, and with a normally grown and formed baby. Women with any medical or surgical complications of pregnancy were excluded from the study. Risk factors at presentation that resulted in exclusion were diabetes (gestational or pregestational), hypertension, abnormal fetal heart rate, bleeding (including placental abruption and placenta previa), multiple gestation, isoimmunization, premature labour (< 37 weeks), chorioamnionitis, premature rupture of membranes (rupture of membranes before the onset of labour), a fetus that was large for gestational age (> 90th percentile for gestational age) or with intrauterine growth restriction (< 10th percentile for gestational age), active genital herpes, HIV positive status, fetal anomaly (major or minor), polyhydramnios, meconium-stained amniotic fluid at presentation, decreased fetal movement, a non-reactive non-stress test, maternal coagulopathy, maternal infection, maternal fever (> 38°C at presentation), any form of cancer affecting the pregnancy, intrauterine death (at presentation) and grand multiparity (> para 6). Risk factors that develop intrapartum are coded separately in the database and were included, as they were necessary to evaluate maternal and neonatal outcomes. These intrapartum risk factors included fetal distress, intrapartum fever (3 readings > 38°C within 6 hours), bleeding, amniotic fluid meconium or abnormal fetal heart rate, dehiscence of previous uterine scar, rupture of a previous uterine incision, and postpartum hemorrhage (> 500 mL if vaginal delivery, >1000 mL if Caesarean section). Women were classified in three groups based on whether they had SL, EI, or ECS, and then into

ABBREVIATIONS

ARM	artificial rupture of membranes
CS	Caesarean section
ECS	elective Caesarean section
EI	elective induction
SL	spontaneous labour

Table 1. Maternal and pregnancy characteristics

Characteristic	Nulliparous					Multiparous				
	SL (n = 3241)		EI (n = 226)		ECS (n = 8)	SL (n = 5426)		EI (n = 635)		ECS (n = 150)
	Mean (SD)	Mean (SD)	<i>P</i> *	Mean (SD)	<i>P</i> *	Mean (SD)	Mean (SD)	<i>P</i> *	Mean (SD)	<i>P</i> *
Maternal age, years	27.1 (5.3)	26.9 (5.6)	0.452	25.4 (6.3)	0.363	30.7 (4.8)	30.4 (5.0)	0.091	32.3 (4.9)	< 0.001
Gestational age, weeks	39.1 (0.9)	39.5 (0.8)	< 0.001	39.4 (1.1)	0.473	39.1 (0.9)	39.3 (0.8)	< 0.001	38.8 (0.8)	< 0.001
Birthweight, grams	3413 (412)	3522 (403)	< 0.001	3471 (511)	0.694	3539 (439)	3605 (467)	< 0.001	3627 (523)	0.016
Duration of 2nd stage of labour, hours	1.97 (1.53)	2.18 (1.39)	0.060	—	—	0.58 (0.79)	0.68 (0.88)	0.004	—	—
Total duration of labour, hours	9.84 (5.02)	7.80 (3.23)	< 0.001	—	—	5.71 (3.61)	4.03 (2.75)	< 0.001	—	—

*Comparisons made against SL using logistic regression. Significant findings were analyzed using post hoc tests to delineate the statistically significant group(s). These findings are described in the results section.

two subgroups: nulliparous (N) or multiparous (M) (1–6 previous deliveries).

The SL group was composed of women who presented to obstetrical triage in active labour (i.e., with regular uterine activity, a cervix that had dilated to at least 3–4 cm and was thinning) with no use of oxytocin and no artificial rupture of membranes prior to active labour. EI was defined as the use of any induction agent (cervical ripening with a Foley catheter, prostaglandins, misoprostol, oxytocin, or ARM) prior to the onset of active labour. The maternal outcomes recorded were unplanned Caesarean section, postpartum complications (hematoma, wound dehiscence, anemia, endometritis, urinary tract infection, wound infection, septicemia), postpartum hemorrhage, blood loss > 1000 mL, maternal fever, breast feeding initiation, vaginal tear, perineal tear, cervical tear, other tear (labial, periurethral, unknown), intact perineum and intrapartum risk factor development (listed above). The neonatal outcomes recorded were NICU triage/admission, positive pressure ventilation use, free-flow oxygen use, 1 and 5 minute Apgar scores < 7, umbilical cord arterial pH < 7.15 and base deficit > 12, macrosomia (birthweight > 4000 g), passage of meconium, and neonatal death. Birth interventions were examined for descriptive purposes, and included assisted birth (forceps or vacuum), episiotomy, regional anaesthesia (epidural, spinal, or spinal-epidural), cervical ripening, ARM, ARM plus oxytocin, ARM plus cervical ripening, ARM plus oxytocin and cervical ripening, and oxytocin for augmentation of SL.

For the outcome analyses, SL served as the comparison group. Descriptive statistics were calculated for the three labour types within N and M deliveries. Logistic regression was used to evaluate differences in maternal age, gestational age, birth weight, and duration of labour between labour types within N and M deliveries separately, comparing EI and ECS with SL. Maternal and neonatal outcome variables were analyzed by chi-square analysis (2 × 2 and 2 × 3 tables, depending on the relevance of ECS). At first pass, EI and ECS were analyzed in a group, comparing them with SL; post-hoc tests (chi-square and logistic regression) were subsequently necessary to identify significant differences (*P* < 0.05). Specifically, chi-square testing was used to compare EI and ECS with SL separately, and logistic regression analysis was used to further examine the relationship between cervical ripening and birth outcome (vaginal or unplanned CS) among the EI group. For those women who had a trial of labour, stepwise logistic regression models were performed to examine the effect of labour type on the incidence of unplanned Caesarean section, allowing for entry at the 5% level (variables entered into the equation if they met 0.05 probability). Labour type, macrosomia, fever, maternal age, gestational age, birthweight, and labour duration were considered as potential factors in these models. With the exception of the logistic regression analysis, for which SAS 9.1 was used, the analysis was performed using SPSS version 13 (SPSS Inc, Chicago, IL).

Table 2. Maternal outcomes by parity and labour type

Outcome	Labour type and parity							
	Nulliparous (n = 3475)				Multiparous (n = 6211)			
	SL (n = 3241) n (%)	EI (n = 226) n (%)	ECS (n = 8) n (%)	P	SL (n = 5426) n (%)	EI (n = 635) n (%)	ECS (n = 150) n (%)	P
Unplanned CS	213 (6.6)	30 (13.3)	—	< 0.001	97 (1.8)	12 (1.9)	—	0.855
Postpartum complications*	590 (18.2)	61 (27.0)	1 (12.5)	0.004	511 (9.4)	84 (13.2)	45 (29.8)	< 0.001
Postpartum hemorrhage	275 (8.5)	22 (9.7)	0 (0.0)	0.557	337 (6.2)	38 (6.0)	2 (1.3)	0.047
Blood loss > 1000 mL	38 (1.2)	3 (1.4)	0 (0.0)	0.940	33 (0.6)	4 (0.7)	4 (2.7)	0.010
Maternal fever	117 (3.6)	11 (4.9)	1 (12.5)	0.264	28 (0.5)	2 (0.3)	0 (0.0)	0.542
Breast feeding initiation	2279 (92.2)	160 (92.5)	5 (71.4)	0.125	3703 (88.7)	418 (85.8)	88 (86.3)	0.147
Vaginal tear	608 (18.8)	35 (15.6)	—	0.226	391 (7.2)	27 (4.3)	—	0.006
Perineal tear	1474 (45.7)	85 (37.8)	—	0.022	2424 (44.8)	242 (38.3)	—	0.002
Cervical tear	11 (0.3)	2 (0.9)	—	0.195	7 (0.1)	1 (0.1)	—	0.851
Other tear†	205 (6.3)	18 (8.0)	—	0.332	194 (3.6)	13 (2.0)	—	0.045
Any tear	1952 (60.2)	124 (54.9)	—	0.112	2767 (51.0)	267 (42.0)	—	< 0.001
Intact perineum	758 (23.4)	67 (29.6)	—	0.033	2269 (41.8)	310 (48.8)	—	0.001
Intrapartum risk development‡	1813 (56.0)	137 (60.6)	—	0.172	1900 (35.0)	233 (36.7)	—	0.408

*Postpartum complications: Any one of the following: hematoma, wound dehiscence, anemia, endometritis, urinary tract infection, wound infection, septicemia, other.

†Other tears: labial, periurethral, unknown

‡Intrapartum risk factors: Any one of the following: fetal distress, intrapartum fever, bleeding, meconium/abnormal fetal heart rate, rupture of a previous uterine incision, postpartum hemorrhage (> 500 mL VB or >1000 mL CS), worsening pregnancy-related hypertension or HELLP

RESULTS

Within the study time frame, 34 332 women gave birth to 35 388 babies. A total of 9686 women met the study criteria. There were 3475 nulliparous women (N-SL = 3241, N-EI = 226, N-ECS = 8) and 6211 multiparous women (M-SL = 5426, M-EI = 635, M-ECS = 150). The EI rate in the studied population was 8.9% and the ECS rate was 1.6%. The maternal and pregnancy characteristics for each labour group are shown in Table 1. The mean age of the mothers was similar in the SL and EI groups. However, the EI group did have slightly higher gestational ages (nulliparas 2.8 days and multiparas 1.4 days older on average), larger babies, and shorter total durations of labour than the SL group, although the M-EI did have a slightly longer second stage of labour. The baseline characteristics of the N-ECS group were not significantly different from the N-SL group, while the M-ECS group had older mothers, shorter gestations, and larger babies. The incidences of various birth interventions were described to compare rates of regional anaesthesia, assisted birth, and episiotomy after SL and EI.

The frequency of use of different methods of induction was also examined for descriptive purposes.

Analysis of the maternal outcomes revealed increased risks for women undergoing elective delivery procedures (Table 2). Unplanned Caesarean section was significantly more common in N-EI (13.3%) than N-SL (6.6%) ($P < 0.001$). When adjusting for macrosomia, maternal fever, maternal age, gestational age, and total duration of labour, the odds of an unplanned Caesarean section was 2.72 times higher after N-EI ($P < 0.001$, 95% CI 1.74 to 4.28). The rate of unplanned Caesarean section in multiparous women was similar in each group (< 2%). Post-hoc analysis of EI revealed a significantly increased incidence of unplanned Caesarean section in women requiring cervical ripening. Unplanned Caesarean section occurred in 25.4% of N-EI women and 4.4% of M-EI women who required cervical ripening, in contrast to those who did not require cervical ripening (7.7% for nulliparous women [$P < 0.001$] and 1.3% for multiparous women [$P < 0.05$]). Postpartum complications were more common in nearly all of the elective birth groups. Both EI groups had significantly increased rates of

Table 3. Neonatal outcomes by parity and labour type

Outcome	Labour type and parity							
	Nulliparous				Multiparous			
	SL (n = 3241) n (%)	EI (n = 226) n (%)	ECS (n = 8) n (%)	<i>P</i>	SL (n = 5426) n (%)	EI (n = 635) n (%)	ECS (n = 150) n (%)	<i>P</i>
NICU—triaged	45 (1.4)	2 (0.9)	1 (12.5)	0.022	45 (0.8)	3 (0.5)	3 (2.0)	0.173
NICU—admitted	153 (4.7)	13 (5.8)	0 (0.0)	0.639	150 (2.8)	26 (4.1)	6 (4.0)	0.125
Positive pressure ventilation	80 (2.5)	1 (0.4)	0 (0.0)	0.135	82 (1.5)	5 (0.8)	1 (0.7)	0.253
Free-flow oxygen	286 (8.8)	18 (8.0)	3 (37.5)	0.015	339 (6.2)	36 (5.7)	18 (11.9)	0.013
1 minute Apgar score < 7	298 (9.2)	21 (9.3)	1 (12.5)	0.948	343 (6.3)	32 (5.0)	13 (8.7)	0.202
5 minute Apgar score < 7	33 (1.0)	2 (0.9)	0 (0.0)	0.943	24 (0.4)	4 (0.6)	0 (0.0)	0.565
Arterial pH < 7.15	245 (8.0)	16 (7.4)	0 (0.0)	0.675	324 (6.4)	31 (5.0)	5 (3.4)	0.142
Base deficit > 12	1 (0.0)	0 (0.0)	0 (0.0)	0.964	0 (0.0)	1 (0.2)	0 (0.0)	0.015
Neonatal death	1 (0.0)	0 (0.0)	0 (0.0)	0.965	1 (0.0)	0 (0.0)	0 (0.0)	0.930
Meconium passage	633 (19.5)	32 (14.2)	2 (25.0)	0.128	768 (14.2)	38 (6.0)	5 (3.3)	< 0.001
Macrosomia*	261 (8.1)	22 (9.7)	1 (12.5)	0.608	794 (14.6)	123 (19.4)	34 (22.5)	< 0.001

*Macrosomia: birthweight > 4000 g

postpartum complications: nulliparas 27% and multiparas 13.2%, compared with 18.2% in SL-N and 9.4% in SL-M. Postpartum complications were also more common in M-ECS women (29.8%); the rate in the N-ECS group was not significantly different. The incidence of most types of tears (in women who underwent labour) was either the same or lower after EI than after SL (Table 2). The incidence of intact perineum (which takes into account both tearing and episiotomy) was significantly higher after EI (Table 2). We used two different outcomes, postpartum hemorrhage and blood loss > 1000 mL, to examine blood loss. The risk of blood loss of > 1000 mL was elevated only in the M-ECS group, but that group had a significantly lower risk of postpartum hemorrhage. There were no significant differences in the rates of maternal fever, intrapartum risk factor development, or breastfeeding initiation.

The rates of adverse neonatal outcomes did not differ significantly between any of the groups (Table 3). The need for NICU triage was higher in the N-ECS group, and free-flow oxygen was more commonly used after ECS. There were no differences in the incidence of NICU admission, positive pressure ventilation use, 1 and 5 minute Apgar scores < 7, arterial pH < 7, or neonatal death. The rates of meconium passage and fetal macrosomia were calculated for descriptive purposes; the multiparous elective birth groups each had higher rates of macrosomia and lower rates of meconium.

DISCUSSION

Our goal was to compare the maternal and neonatal outcomes following elective induction of labour and elective Caesarean section with those following spontaneous labour. Some previous studies in this area have produced results that are difficult to interpret because of the inconsistent definition of “elective” and the inclusion of post-term pregnancies and pregnancies with known maternal or neonatal risk factors. We examined 10 years of deliveries using a prospectively maintained maternal–neonatal database; exclusion of post-term pregnancies and women with any known risk factors enabled us to analyze these procedures under the most ideal circumstances. In our selected population, the elective rate of induction of labour (8.9%) and the elective Caesarean section rate (1.6%) were lower than those described in recent reports.^{2,9,16} One explanation for the lower rates of elective delivery procedures in our study could be our stringent exclusion of women with medical complications, whose conditions may have contributed to the decision to have elective induction of labour or elective Caesarean section.

Nulliparous women with a term fetus and no medical or surgical complications of pregnancy who chose induction of labour were at 2.7 times higher risk of having an unplanned Caesarean section. However, multiparous women who were similarly devoid of identifiable maternal or fetal complications were not at a higher risk of having an unplanned Caesarean section than women in the spontaneous labour group. In both nulliparous and multiparous

women, unplanned Caesarean section was significantly more common if cervical ripening was required. Despite varied inclusion criteria, a number of previous studies examining elective induction have also found that unplanned Caesarean section is more common after elective induction of labour, particularly in nulliparous women.^{13–15,21–25} Vrouenraets et al. found that the rate of Caesarean section was not increased after elective induction if the cervix was favourable.¹⁷ Our analysis also supports the notion that the state of cervical ripeness prior to induction may be an important prognostic factor for the success of the induction.

Both elective induction of labour and elective Caesarean section were associated with increased risks of postpartum complications such as hematoma, wound infection, and septicemia. One large Canadian study found that maternal complications after Caesarean section in nulliparous women were limited to febrile morbidity.²⁶ We examined this maternal complication individually in our study but were unable to replicate this finding.

One of the most cited reasons why women request delivery by Caesarean section is to avoid injury to the pelvic floor.² Although elective induction of labour with the aim of a vaginal delivery is not commonly associated with this benefit, our study suggests that induction may be protective of the perineum, or at least no more harmful than spontaneous labour. We speculate that this may, in part, be due to the slightly longer second stage of labour in women who have an elective induction. We found that the M-EI group had a significantly longer second stage, and the N-EI women experienced a similar trend. This extra time in the second stage could plausibly permit more accommodation by the bony pelvis and stretching of the vaginal and pelvic tissues, factors that might help to protect the perineum at delivery.

Overall, we found very little difference in neonatal risk after EI or ECS. Some evidence suggested that neonatal respiration may be impaired after ECS, which is consistent with previous studies that have reported increased neonatal respiratory distress after Caesarean section.^{27–29} The low incidence of respiratory problems in neonates in our study might be partially explained by the average gestational ages at the time of delivery, which were at or beyond 39 weeks in the majority of cases. EI was found to be comparable to SL with respect to neonatal risks.

Potentially limiting factors in this study are the inclusion of attempted vaginal delivery after one Caesarean section in the spontaneous labour group (as such patients have a higher Caesarean section rate), our ability to control for method of induction (prostaglandins were seldom used), and the small sample size for elective Caesarean section, particularly in the nulliparous group. The study was limited

by the retrospective use of a database, allowing only the available variables to be used. Our centre, for example, does not routinely record a Bishop score in the database for patients undergoing induction of labour; we therefore approached this variable by examining the need for cervical ripening as the surrogate. Finally, it is possible that our study may have underestimated the number of women who chose elective delivery options; an indication of mild risk by the attending care provider would have resulted in exclusion from our study population.

CONCLUSION

Our findings indicate that in healthy pregnant women between 37 and 41 weeks' gestation, with no medical or surgical complications and with a normally grown and formed fetus, elective delivery options are associated with increased maternal and neonatal risks. A woman having her first child by elective induction of labour is at increased risk of having an unplanned Caesarean section and of having postpartum complications, and primary elective Caesarean section is associated with a higher rate of neonatal respiratory problems. Multiparous women undergoing elective induction of labour do not appear to be at greater risk of having an unplanned Caesarean section, but they do have higher rates of postpartum complications. Elective Caesarean section in multiparous women is also associated with an increased risk of postpartum complications. The need for cervical ripening in elective induction of labour is associated with a higher incidence of unplanned Caesarean section in both nulliparous and multiparous women undergoing induction.

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