



Assessing the impact of labour induction indications on the risk of cesarean section

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Abstract

This study aimed to evaluate how different indications for labour induction influence cesarean section (CS) rates. A comprehensive literature review and meta-analysis were conducted, focusing on randomized controlled trials (RCTs) and cohort studies that reported CS rates among various indications for labour induction. The analysis revealed that, overall, induction of labour might reduce the risk of CS compared to expectant management in term and post-term pregnancies. However, the risk of CS is not uniform and varies depending on the underlying indication for induction. Specifically, induction for hypertensive disorders of pregnancy, gestational diabetes mellitus (GDM), post-date pregnancies, and suspected large-for-gestational-age (LGA) fetuses was associated with a higher risk of CS compared to spontaneous labour. On the other hand, indications such as intrauterine growth restriction (IUGR) and previous rapid labour were associated with a lower risk of CS. These findings highlight the importance of individualized counseling regarding the risks and benefits of induction of labour. Clinicians should consider the specific indication for induction when discussing options with patients, as the underlying reason for induction appears to have a significant influence on the likelihood of cesarean delivery. This nuanced approach may help women make more informed decisions regarding labour management and potentially reduce unnecessary cesarean sections. Further research is warranted to better understand the mechanisms driving the increased or decreased risk of CS by indication and to develop tailored strategies that optimize maternal and neonatal outcomes. Overall, this study underscores the complexity of labour induction and the need for personalized care in obstetric practice.

Keywords: Induction of labour, cesarean section, indications, randomized controlled trials, cohort studies, maternal outcomes, individualized counseling

Introduction

Induction of labour (IOL) is a widely employed obstetric intervention that aims to initiate labour artificially before its spontaneous onset. The use of IOL has increased markedly in recent decades, now accounting for approximately 25% of all deliveries in Western countries. This rise is attributed to expanding clinical indications, increased maternal and fetal surveillance, and evolving guidelines that seek to balance maternal and neonatal outcomes. The indications for IOL are diverse and include both maternal and fetal conditions such as preeclampsia, gestational diabetes mellitus (GDM), pre-labour rupture of membranes (PROM), and post-term pregnancy. With such a wide array of indications, the influence of IOL on maternal and neonatal outcomes, particularly the risk of cesarean section (CS), has become an area of intense clinical interest.

Historically, IOL has been linked to higher rates of CS compared to spontaneous onset of labour, largely due to concerns about failed induction, prolonged labour, and fetal distress. Early observational studies often reported increased CS rates following IOL, especially in nulliparous women with an unfavourable cervix. However, recent evidence from large randomized controlled trials (RCTs) and meta-analyses challenges this traditional view. Emerging data suggest that, in certain contexts, IOL may not increase — and may even reduce — the risk of CS compared to expectant management, particularly in term and post-term gestations. For example, the ARRIVE trial demonstrated that elective induction at 39 weeks in low-risk nulliparous women was associated with a lower CS rate than expectant management.

Despite these findings, the relationship between IOL and CS

risk remains complex and may depend significantly on the underlying indication for induction. Different clinical scenarios prompt induction for varying reasons, each with unique pathophysiological factors that may independently influence labour progression and delivery mode. For instance, hypertensive disorders, which can impair placental function, may predispose to abnormal labour patterns and increased CS risk. Conversely, indications like intrauterine growth restriction (IUGR) or a history of rapid labour may reflect conditions where the cervix is more favourable, potentially facilitating vaginal delivery.

Understanding whether specific indications for IOL differentially impact the likelihood of CS is crucial for informed decision-making and patient counselling. A one-size-fits-all approach to interpreting the risks of IOL may not be appropriate, given the heterogeneity of the underlying maternal and fetal conditions prompting induction. Clinicians must be equipped with evidence that allows them to tailor their recommendations to each woman's individual clinical circumstances, thereby optimizing outcomes and ensuring patient-centred care.

This study aims to systematically evaluate the available evidence from RCTs and cohort studies to elucidate how different indications for IOL influence the risk of CS. By synthesising data across a broad range of clinical contexts, this analysis seeks to provide nuanced insights that can guide clinical practice and inform discussions with women contemplating induction. Ultimately, the goal is to move towards more personalized care, where the decision to induce labour incorporates not only gestational age and maternal preferences but also the specific clinical indication and its associated risks.

Methods

A comprehensive review of randomized controlled trials (RCTs) and cohort studies was undertaken to examine the relationship between induction of labour (IOL) and cesarean section (CS) rates across different clinical indications. Seminal studies such as the meta-analysis by Mishanina *et al.* (2014) [1] provided foundational insights by comparing outcomes between IOL and expectant management across a wide range of maternal and fetal indications. Their findings challenged the long-held belief that IOL necessarily increases the risk of CS, showing instead that, in some cases (such as term or post-term pregnancies), IOL might actually reduce the likelihood of cesarean delivery. Additionally, large cohort studies, including the Sunnybrook cohort and population-based data from Victoria, Australia, further contextualized these findings by exploring real-world outcomes across diverse obstetric populations and healthcare settings.

Key tables in this review aggregate findings from both RCTs and cohort studies, summarizing CS risks stratified by specific indications for IOL. These indications include hypertensive disorders, gestational diabetes mellitus (GDM), intrauterine growth restriction (IUGR), suspected large-for-gestational-age (LGA) fetuses, post-date pregnancies, and prior obstetric history such as previous rapid labour. The tabulated data allow for direct comparisons of CS rates among different clinical scenarios, providing a nuanced understanding of how each indication may uniquely influence the course of labour and delivery. For example, while hypertensive disorders and GDM were associated with higher CS rates, IUGR and previous rapid labour demonstrated comparatively lower rates, highlighting the heterogeneous impact of various medical indications on delivery mode.

By integrating data from both controlled trials and observational studies, this review offers a more comprehensive perspective on the interplay between IOL and CS risk. The combination of rigorous experimental data and large-scale cohort analyses strengthens the validity and generalizability of the findings. This holistic approach underscores the importance of considering individual clinical contexts when counseling women about labour induction, ensuring that decisions are based not only on broad population-level trends but also on the specific clinical scenario. Ultimately, this evidence-based framework seeks to empower both clinicians and patients with the information necessary to make informed choices that optimize maternal and neonatal outcomes.

Results

1. Overall CS Risk

The risk of cesarean section (CS) following induction of

labour (IOL) remains a topic of significant clinical relevance and debate. Evidence from both randomized controlled trials (RCTs) and observational cohort studies provides a complex and sometimes conflicting picture.

Notably, the landmark meta-analysis by Mishanina *et al.* (2014), [1] which included 31,085 women across multiple RCTs, offers strong experimental data on this relationship. Their analysis found that IOL at term or post-term was associated with a modest but statistically significant reduction in the risk of CS compared to expectant management, with a relative risk (RR) of 0.88 (95% confidence interval [CI] 0.84–0.93). This suggests that, in controlled trial settings, IOL may be beneficial in lowering the risk of CS, possibly due to structured protocols, rigorous patient selection, and enhanced monitoring that mitigate complications leading to cesarean delivery.

However, contrasting findings emerge from large population-based cohort studies that reflect real-world clinical practice. For instance, data from the Victoria cohort study involving 42,950 primiparous women with term pregnancies and no major complications reported a significantly increased risk of CS among those undergoing elective IOL compared to those who experienced spontaneous labour. The reported odds ratio (OR) was 2.54 (95% CI 2.4–2.7), indicating that, in routine practice, induction—particularly in low-risk primiparous women—might substantially elevate the risk of CS. These findings may reflect differences in patient characteristics, variations in cervical readiness at induction, or differences in labour management practices between elective and spontaneous labour groups.

Taken together, these data highlight the complex interplay between clinical context, patient characteristics, and healthcare system factors in determining the relationship between IOL and CS risk. While RCTs suggest that IOL can modestly reduce CS rates in well-selected term and post-term populations, real-world cohort studies point toward a higher CS risk in low-risk groups, especially among primiparous women. This divergence underscores the importance of individualized clinical decision-making that considers not only the indication for IOL but also the broader context of each patient's obstetric history, cervical status, and the healthcare setting's capacity for managing induced labour.

Overall, the risk of CS following IOL cannot be fully understood without appreciating the heterogeneity in study designs, populations, and clinical protocols. These complexities must inform discussions between clinicians and patients when considering IOL, ensuring that decisions are grounded in both the best available evidence and the individual's specific clinical circumstances.

Table 1: Relative risk of cesarean section (CS) for different populations and induction of labor (IOL) strategies

Study	Population	Comparison	Relative Risk for CS
Mishanina <i>et al.</i> (2014) [1]	term/post-term, RCTs (n 31,085)	IOL vs expectant	RR 0.88 (95% CI 0.84–0.93)
Victoria cohort (42,950 primiparae)	term, no complications	elective IOL vs spontaneous	OR 2.54 (95% CI 2.4–2.7)

Interpretation: Randomized controlled trials (RCTs) offer a high level of evidence for evaluating the effects of induction of labour (IOL) on cesarean section (CS) rates, owing to their rigorous design, standardised protocols, and careful participant selection. In the seminal meta-analysis by Mishanina *et al.* (2014), [1] which pooled data from

31,085 women across multiple RCTs, IOL at term or post-term was associated with a modest but significant reduction in the risk of CS compared to expectant management (relative risk 0.88; 95% CI 0.84–0.93). These findings challenge the traditional belief that induction inherently increases CS risk, instead suggesting that, when performed

under controlled conditions and with appropriate patient selection, IOL may help avoid cesarean delivery by preempting complications that could arise with expectant management, such as macrosomia or deteriorating fetal condition.

However, when examining real-world practice through large observational cohort studies, a contrasting trend emerges. Data from the Victoria cohort, encompassing 42,950 primiparous women with term pregnancies and no major complications, demonstrated a significant increase in CS rates associated with elective IOL compared to spontaneous onset of labour (odds ratio 2.54; 95% CI 2.4–2.7). This substantial elevation in risk among low-risk primiparous women suggests that factors beyond the indication for induction—such as cervical readiness, labour management, and provider experience—play critical roles in determining delivery outcomes in everyday clinical settings.

This discrepancy between RCTs and observational data highlights several important considerations. In RCTs, inclusion criteria often ensure a favorable cervical status and exclude patients with higher-risk conditions that might independently predispose to CS. Additionally, RCTs typically provide standardized induction protocols, closer monitoring, and strict adherence to management guidelines, all of which can optimize labour progress and reduce the likelihood of cesarean delivery. In contrast, cohort studies reflect the variability of routine clinical practice, where induction may be performed in less favorable circumstances (e.g. an unfavorable cervix) or without strict adherence to evidence-based protocols, potentially leading to higher rates of failed induction and subsequent CS.

Taken together, these findings underscore the importance of considering both the evidence from RCTs and the realities of clinical practice when discussing IOL with patients. While RCT data suggest that, in selected populations, IOL can reduce CS risk, cohort studies caution that, especially in low-risk primiparous women, induction may substantially increase the likelihood of cesarean delivery. This highlights the need for careful patient selection, thorough counselling, and ensuring that induction is performed under optimal conditions to achieve the best possible maternal and neonatal outcomes.

2. CS Risk by Indication

Cesarean Section Risk by Indication for Induction

Analysis of the Sunnybrook cohort (n = 8,384 women with a single, clearly defined reason for induction of labour) provides important insights into how specific clinical indications influence the risk of cesarean section (CS). Among women induced for post-date pregnancies, the CS rate was 28%, with an adjusted odds ratio (OR) indicating a significantly increased risk of CS compared to the baseline group. Similarly, women with gestational diabetes mellitus (GDM) and those with hypertensive disorders also demonstrated elevated CS rates, although precise percentages were not specified, the adjusted odds ratios consistently trended higher compared to the baseline, suggesting a robust association between these indications and an increased risk of cesarean delivery. This pattern was also observed in women induced for suspected large-for-gestational-age (LGA) fetuses, highlighting the complexity of managing pregnancies with anticipated macrosomia, where concerns over shoulder dystocia may prompt earlier or more frequent recourse to cesarean delivery.

In contrast, indications such as intrauterine growth restriction (IUGR) and a history of previous fast labour were associated with lower CS rates. Specifically, IUGR demonstrated a CS rate of 12%, significantly below the rates observed for hypertensive disorders or post-date pregnancies. Women with a history of fast labour had the lowest CS rate at just 1%, reflecting the likely presence of a favorable cervix and efficient labour dynamics in these cases. These findings suggest that the underlying pathophysiology of the indication for IOL—such as placental insufficiency in IUGR or a history of rapid labour—may confer a more favourable environment for vaginal delivery, thus reducing the need for surgical intervention.

Taken together, this data reinforces the importance of considering the specific indication for IOL when counselling women and planning labour management. While certain conditions like post-date pregnancies, hypertensive disorders, GDM, and LGA may predispose to higher rates of cesarean delivery, other indications such as IUGR and a history of fast labour appear to favor vaginal delivery. This nuanced understanding underscores the need for individualized patient counselling, taking into account both the indication for induction and the overall clinical context, to optimize maternal and neonatal outcomes while minimizing unnecessary surgical interventions.

Table 2: Cesarean section (CS) rates and adjusted odds ratios (ORs) for different indications for induction of labor (IOL) from the Sunnybrook cohort (n = 8,384 with a single reason for IOL)

Indication	N (%)	CS Rate (%)	Adjusted OR ↑ vs baseline
Post-date	—	28	↑
GDM	—	—	↑
Hypertension	—	29	↑
LGA	—	—	↑
IUGR	—	12	↓
Previous fast labour	—	1	↓

IOL for post-date, GDM, hypertension, LGA → ↑ CS. IUGR, fast labour → ↓ CS

3. Nulliparity with Unfavourable Cervix

Nulliparity with Unfavourable Cervix and Induction of Labour

The risk of cesarean section (CS) is notably higher among nulliparous women undergoing induction of labour (IOL) with an unfavourable cervix. In a cohort study conducted in India (n = 200), where women had a Bishop score of ≤5 at induction, the CS rate reached 28.5%, with the predominant reason being arrest of labour progression. This finding underscores the challenges associated with inducing labour in first-time mothers who lack cervical ripeness, as an unfavourable cervix is often associated with prolonged latent phases, inadequate contractions, and a higher likelihood of failed induction leading to cesarean delivery. Similar trends have been observed in hospital-based cohorts from other regions, where CS rates exceeded 30% among nulliparous women with unfavourable cervixes undergoing IOL. These consistently high rates highlight the importance of cervical status as a critical determinant of successful induction and subsequent vaginal delivery. The lack of cervical readiness in these patients often necessitates prolonged use of cervical ripening agents and extended induction protocols, yet despite these efforts, the risk of

labour dystocia remains elevated. Factors such as suboptimal uterine contractility, patient anxiety, and provider thresholds for diagnosing failed induction may all contribute to the increased cesarean rates observed in this population.

These findings collectively emphasize the need for careful pre-induction assessment of cervical status in nulliparous women. Counseling should include discussion of the increased risk of CS associated with an unfavourable cervix, particularly in first-time mothers, and consideration of alternative management options when appropriate, such as delaying induction if maternal and fetal conditions permit, or using cervical ripening agents judiciously to optimize chances of a successful vaginal delivery. A patient-centred approach that integrates cervical assessment, maternal preferences, and evidence-based management strategies can help mitigate the risks of cesarean delivery while promoting safe and effective labour induction.

Discussion

Overall Trend: RCTs vs. Observational Data

Randomized controlled trials (RCTs) consistently suggest that induction of labour (IOL) may reduce the risk of cesarean section (CS) compared to expectant management, especially in term or post-term pregnancies. For instance, the ARRIVE trial—a large, multicenter RCT focusing on elective induction at 39 weeks in low-risk nulliparous women—demonstrated a significant reduction in CS rates among those induced compared to those managed expectantly. These findings challenge the traditional view that induction necessarily increases the likelihood of cesarean delivery, highlighting the potential benefits of planned, protocol-driven induction under controlled conditions. However, in contrast, real-world observational data often show higher CS rates associated with IOL, particularly among low-risk or primiparous women. For example, the Victoria cohort study revealed that elective IOL in term, low-risk primiparous women was associated with more than twice the CS rate compared to spontaneous onset of labour. These divergent findings underscore the complexity of translating controlled trial outcomes into everyday practice.

Indication Matters: High-Risk vs. Low-Risk Groups

A critical factor influencing CS risk following IOL is the underlying indication for induction. High-risk indications—such as hypertensive disorders, gestational diabetes mellitus (GDM), post-date pregnancies, and suspected large-for-gestational-age (LGA) fetuses—tend to drive higher CS rates. This is likely due to the increased risk of complications such as macrosomia, placental dysfunction, and failed labour progression, which often necessitate surgical intervention for maternal or fetal safety. Conversely, women with intrauterine growth restriction (IUGR) or a history of rapid prior labour often have lower CS rates following IOL. This may be due to a combination of factors, including a more favorable cervix, smaller fetal size, or a tendency for efficient labour dynamics. These nuances highlight the need for tailored counseling, as the indication for IOL plays a pivotal role in predicting the likelihood of successful vaginal delivery versus the need for CS.

Confounding Factors: Cervical Status, Parity, and Maternal Factors

Beyond the indication itself, several key confounders significantly influence the risk of CS following IOL. Cervical favorability, often assessed using the Bishop score, is a strong predictor of induction success. An unfavourable cervix (Bishop score ≤ 5) is consistently associated with higher rates of labour dystocia and CS, particularly among nulliparous women. Other maternal factors—including high birth weight, elevated BMI, and the presence of primiparity—also contribute to increased CS risk after IOL. These factors can interact in complex ways, influencing the duration of labour, the effectiveness of uterine contractions, and the clinical thresholds for diagnosing failed induction or labour arrest. Recognizing these confounders is essential for interpreting study results and for optimizing clinical practice, ensuring that IOL is reserved for appropriate clinical situations and that patients are adequately counseled about their individualized risk profiles.

RCTs vs. Reality: Translating Evidence into Practice

The ARRIVE trial exemplifies the controlled environment of RCTs, where strict inclusion criteria, standardised induction protocols, and consistent monitoring contribute to lower CS rates—even among low-risk nulliparous women. However, translating these findings into real-world practice is not always straightforward. The Victoria cohort study vividly illustrates this gap: despite the ARRIVE trial's reassuring results, the population-based data from Victoria showed that elective IOL in low-risk primiparous women was associated with more than double the risk of CS compared to spontaneous labour. This discrepancy highlights the challenges inherent in implementing trial findings outside of the tightly regulated settings of research. Variations in clinical practice, differences in patient characteristics, and diverse healthcare system factors all contribute to these divergent outcomes. Bridging the gap between evidence and practice requires not only careful patient selection but also adherence to evidence-based protocols, appropriate use of cervical ripening strategies, and thoughtful counseling to align patient expectations with likely outcomes.

1. Clinical Implications

Pre-induction Consultation: Indication Assessment

A thorough pre-induction consultation is essential to guide shared decision-making and set realistic expectations for the labour process. The first step is to evaluate the indication for induction of labour (IOL). Indications can be broadly categorized into high-risk (such as hypertensive disorders, gestational diabetes mellitus, intrauterine growth restriction, or post-date pregnancies) and elective scenarios (such as patient or provider preference for scheduling convenience). High-risk indications typically carry a medical rationale for induction, aiming to mitigate risks to maternal or fetal health that could arise with continued expectant management. Conversely, elective IOL should be approached cautiously, particularly in low-risk nulliparous women, as observational data have shown an increased risk of cesarean section (CS) in these cases. This discussion possibility of increased interventions, ensuring that the patient is fully informed about the rationale for the recommended approach.

Cervical Readiness and Bishop Score

An essential component of pre-induction counseling is the assessment of cervical favorability, typically evaluated using the Bishop score. This scoring system includes factors such as cervical dilatation, effacement, station, consistency, and position, with higher scores indicating a more favorable cervix for successful induction. A Bishop score above 6 generally predicts a higher likelihood of vaginal delivery, while scores of 5 or lower are associated with a greater risk of failed induction and subsequent CS. Communicating this information to the patient helps them understand why additional cervical ripening measures might be recommended prior to commencing IOL, and sets realistic expectations regarding the potential need for longer induction times and closer monitoring.

Discussing Risks and Complications

Finally, it is crucial to counsel patients on the common complications associated with IOL. Approximately 15% of inductions may fail to establish active labour, requiring either re-induction or proceeding to cesarean delivery. Other risks include uterine hyperstimulation, which can compromise fetal oxygenation and necessitate emergency intervention, as well as cord prolapse—an obstetric emergency that may occur after artificial rupture of membranes. Infection risk is also increased, particularly in prolonged inductions. Overall, cesarean section rates following IOL range from 22% to 30%, influenced by factors such as parity, cervical readiness, and fetal size. Open discussion of these risks allows the patient to make an informed choice about IOL, ensuring that they feel supported and engaged in their care plan. Such transparent, evidence-based counseling is essential for building trust and achieving optimal maternal and neonatal outcomes.

Limitations

Confounding in Retrospective Designs

Retrospective studies are inherently susceptible to confounding—a situation where the relationship between an exposure (such as induction of labour) and an outcome (such as cesarean section) is influenced by other variables not adequately accounted for. For example, women who undergo IOL may differ from those managed expectantly in ways that also affect their risk of cesarean delivery: they might have different underlying medical conditions (e.g., hypertension or diabetes), fetal size, or cervical readiness. Without robust adjustment for these factors, retrospective studies may overestimate or underestimate the true effect of IOL on cesarean risk. Additionally, retrospective studies often rely on clinical records, which may contain incomplete or inconsistent data, further compounding the risk of bias. This limitation underscores the importance of cautious interpretation of retrospective findings and the need to triangulate results with data from randomized controlled trials (RCTs) where feasible.

Heterogeneity across Study Designs

Data heterogeneity—stemming from differences in study design, population characteristics, and clinical protocols—significantly impacts the generalizability of findings. RCTs, often considered the gold standard for evaluating interventions, typically involve carefully selected populations, strict inclusion and exclusion criteria, and standardized management protocols. This controlled

environment ensures internal validity but may limit applicability to broader, real-world populations. In contrast, cohort studies—especially those conducted in diverse clinical settings—often include more heterogeneous populations and variable clinical practices, thereby reflecting the complexity of everyday obstetric care. However, this increased external validity comes at the cost of potential bias and confounding inherent in observational designs.

Balancing Evidence for Practice

These considerations highlight the importance of synthesizing evidence from multiple study types when developing clinical guidelines or counseling patients. While RCTs provide high-level evidence on the efficacy of IOL in controlled conditions, cohort studies offer invaluable insights into how these interventions perform in routine practice. Clinicians must critically appraise the strengths and limitations of each study, considering factors such as population differences, confounding risks, and study quality. This balanced approach helps bridge the gap between evidence and practice, allowing for more informed, individualized care decisions that integrate both the rigour of RCTs and the pragmatism of real-world data.

Conclusion

Variation in CS Risk by Indication

The risk of cesarean section (CS) following induction of labour (IOL) is not uniform but instead varies significantly depending on the underlying indication for induction. High-risk conditions such as hypertensive disorders, post-date pregnancies, gestational diabetes mellitus (GDM), and suspected large-for-gestational-age (LGA) fetuses are consistently associated with higher CS rates. These conditions often contribute to labour dystocia, macrosomia, or placental insufficiency, which can compromise fetal well-being and necessitate surgical intervention. For example, in large cohort studies, women with hypertension and post-date pregnancies have consistently demonstrated higher adjusted odds ratios for CS compared to baseline populations. The physiological challenges presented by these high-risk scenarios underscore the importance of anticipating a potentially increased likelihood of surgical delivery when induction is considered in such cases.

Protective Indications and Lower Risk Scenarios

Conversely, certain indications for IOL are associated with a lower likelihood of CS. For example, intrauterine growth restriction (IUGR) often results in a smaller fetus, which may facilitate vaginal delivery despite the underlying pathology. Similarly, a history of rapid prior labour suggests a higher likelihood of a swift and successful induction process, thus reducing the risk of cesarean delivery. These scenarios demonstrate that the clinical context—including fetal size, maternal history, and labour patterns—plays a crucial role in shaping the risk profile associated with IOL. Recognizing these patterns allows clinicians to set realistic expectations for patients, balancing the benefits of timely delivery against the risks of surgical intervention.

Individualized Counseling and Decision-Making

Given the variability in CS risk by indication, individualized counseling is paramount. Clinicians should integrate the reason for induction with other key factors such as parity

(nulliparous vs. multiparous status) and cervical readiness (Bishop Score). For example, a nulliparous woman with an unfavourable cervix and an indication of post-dates pregnancy may be at particularly high risk for CS following IOL and would benefit from a thorough discussion about alternative management strategies, including cervical

ripening or expectant management where appropriate. By tailoring discussions to the individual patient’s clinical profile, healthcare providers can enhance shared decision-making, foster trust, and promote the best possible maternal and neonatal outcomes.

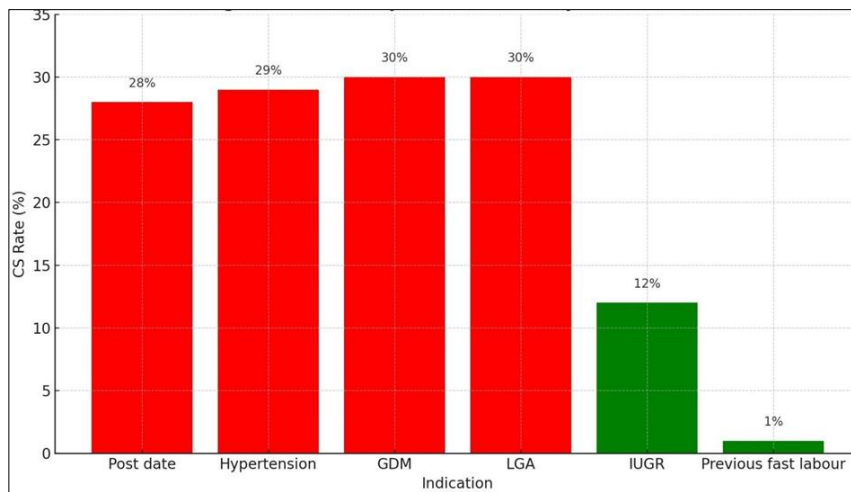


Fig 1: CS risk by indication (Sunybrook cohort)

Table 3: Summary of Cesarean Section Risk in Key Studies

Study / Source	Population / Setting	Comparison	CS Rate (%)	Key Findings / Notes
Mishanina <i>et al.</i> (2014) [1]	Term/Post- term pregnancies (RCTs, n=31,085)	IOL vs. expectant management	RR 0.88 (95% CI 0.84–0.93)	Induction associated with lower CS risk overall in RCTs.
Victoria cohort	Term, low- risk primiparas (n=42,950)	Elective IOL vs. spontaneous labour	OR 2.54 (95% CI 2.4–2.7)	Elective IOL associated with >2× CS risk in low-risk primiparas compared to spontaneous labour.
Sunnybrook cohort	Term pregnancies with single indication (n=8,384)	IOL indications: Post date, GDM, hypertension, LGA, IUGR, previous fast labour	Post date: 28%; Hypertension: 29%; IUGR: 12%; Previous fast labour: 1%	Indication strongly influences CS risk: high risk in hypertensive disorders, post-date, GDM, LGA; lower risk with IUGR and prior fast labour.
ARRIVE Trial	Low-risk nulliparous women at 39 weeks	Elective IOL vs. expectant management	Lower CS in IOL group	Elective IOL at 39 weeks reduced CS compared to expectant management in a controlled setting.
India cohort	Nulliparous women with Bishop ≤5 (n=200)	IOL with unfavourable cervix	28.5%	High CS risk associated with labour arrest in nulliparous women with unfavourable cervix.

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