



INDUCTION AND AUGMENTATION OF LABOR IN INDIA: EXCESSIVE AND INAPPROPRIATE USE OF UTEROTONICS IN AND OUT OF HEALTH FACILITIES

Key findings from a systematic review

INDUCTION AND AUGMENTATION OF LABOR, when medically indicated and safely provided, can improve outcomes for women and newborns. The following measures make induction and augmentation safe: careful dose titration, close maternal and fetal monitoring, and rapid management of complications. The World Health Organization (WHO) Labor Care Guide, designed to replace the partograph, includes indications for augmentation.^{1,2,3}

Improving quality of care for women and newborns is a major priority in India, which accounts for 12% of global maternal deaths, 17% of global stillbirths, and 20% of global neonatal deaths. Previous research in India has shown high augmentation rates, with estimates that more than half of births occur after augmentation of labor.⁴⁻⁸ Less is known regarding induction of labor in India.

The MOMENTUM Safe Surgery in Family Planning and Obstetrics project conducted a systematic review of peer-reviewed publications reporting primary data on pharmacological induction and augmentation of labor in India published between January 1, 2011 and December 31, 2022. The goal was to determine the prevalence and features of induction and augmentation of labor. This review identified 59 high-quality studies, highly variable in design, geographies, women's profiles, and outcome measures.

Induction of labor is the artificial stimulation of cervical ripening and progressive uterine contractions to initiate birth.¹

Augmentation of labor is the process of stimulating the uterus to increase the frequency, duration, and intensity of contractions after the onset of labor.²

Uterotonics are drugs that can increase uterine contractions and be used for induction or augmentation.

Table 1: Distributions of studies in a systematic review on induction and augmentation of labor in India
(Manuscript in process)

Publication years (N)	2011 (7), 2012 (4), 2013 (5), 2014 (6), 2015 (3), 2016 (2), 2017 (4), 2018 (6), 2019 (2), 2020 (5), 2021 (10), 2022 (5)
India geography and states (N)	<u>North</u> : Delhi (4), Haryana (2), Punjab (3), Rajasthan (2), Himachal Pradesh (2); <u>South</u> : Kerala (1), Karnataka (10), Tamil Nadu (7), Puducherry (3); <u>East</u> : West Bengal (2), Odisha (3), Bihar (2); <u>West</u> : Gujarat (5), Maharashtra (6); <u>Northeast</u> : Tripura (1); <u>Central</u> : Uttar Pradesh (9), Chhattisgarh (2)
Settings (N)	CEmOC health facilities (49), CEmOC and BEmOC health facilities (2), Health facilities and homes/communities (8)

Note: Some studies were carried out in two or more states. N = number of studies. CEmOC: Comprehensive Emergency Obstetric Care. BEmOC: Basic Emergency Obstetric Care.

Key finding: Induction of labor in India – rates and regimens vary widely

- **Induction rates varied between 3% to 85%** in this review, depending on the setting where induction occurred and women’s characteristics (n=20 studies). Nearly all the studies reported data from health facilities providing CEmOC and there were variations across study populations. All women in labor: 2.3% - 34.5% (n=9); women with chronic conditions warranting induction: 3.8% - 62.5% (n=12); women with poor fetal outcome: 21.8% - 84.6% (n=4), women with poor maternal outcome: 52.9% (n = 1).
- A **wide variety of induction drugs*** and **administration regimens†** were described as being used for labor induction in these studies.

Key finding: Augmentation of labor is very common in India

- **Augmentation rates varied between 10% and 87%** (n=26 studies). There were variations across study populations: all women in labor: 16.5%- 93.0% (n=6); all women undergoing induction of labor: 9.6% - 86.9% (n=13); women with chronic conditions warranting induction: 26.0% - 81.6% (n=3); women with poor fetal outcome: 32.9% - 85.2% (n = 3), women with one previous cesarean section: 13.5% (n=1).
- Augmentation of labor is most common among women whose labor was induced, **compounding the risks**.

Key finding: Important opportunities to strengthen fidelity to WHO and Indian guidelines in some settings⁹

The systematic review found:

- **Unsafe place of care:** Induction and augmentation of labor were practiced in primary health care facilities and even at home in some settings in India.
- **Suboptimal monitoring of the woman and fetus** including poor use of labor monitoring tool and shortages of skilled attendants.
- Induction and augmentation of labor **without medical indication** are common.

* Misoprostol, estradiol, dinoprostone, hyaluronidase, valetamate bromide, hyoscine butylbromide.

† Cervical, vaginal, sublingual, oral, combination of pharmacological agents with high-/low-volume Foley’s catheter, artificial rupture of membranes or traditional medicines (e.g., castor oil), 4- or 6-hourly doses, 24h/36h time limit for concluding to failure.

- **Inappropriate routes of oxytocin augmentation** including bolus intramuscular/intravenous injections instead of carefully titrated infusions.
- **Inappropriate augmentation drugs:** One study aiming at understanding the practices regarding uterotonics during active labor reported misoprostol for augmentation.
- **Knowledge gaps among health providers** regarding oxytocin refrigerated storage, augmentation dosage, and maternal and fetal monitoring.

Key finding: Drivers of high rates of augmentation of labor in India arise from both communities (demand side) and health systems (supply side)

- **Community beliefs suggest that augmentation of labor is the norm for high-quality intrapartum care**, co-existing with a very low perception of the associated risks.
- **Health facilities likely have an institutional culture of augmentation of labor** without clear medical indications, even when health providers are knowledgeable of guidelines (know-do gap).
- Overcrowded labor and delivery wards are sometimes managed with **augmentation to shorten labor** in some settings.

Limitations: Scarc data to assess the impact of induction and augmentation on labor outcomes

- Studies included in the review were **mainly quantitative** and most examined **facility-based augmentation and induction of labor** practices.
- **High heterogeneity** of included studies (designs, settings, geographies, women's profiles, and outcomes measures) **prevented meta-analysis and strong conclusions** regarding maternal and fetal outcomes of augmentation and induction of labor.
- **A causal relationship** between induction and augmentation and labor complications was not possible among included studies. Nevertheless, it has been demonstrated through other published global research that inappropriate induction and/or augmentation significantly increases rates of labor complications (e.g., acute fetal distress, stillbirth, ruptured uterus, uterine hyperstimulation).
- Due to **paucity of data**, we were not able to directly **compare the rates of labor complications** between women who experienced induction and/or augmentation and those who did not.

Key considerations on the way forward

This systematic review has highlighted high rates of augmentation and induction of labor in India. Augmentation after induction of labor is very common, provided by multiple regimens. Included studies indicated there is strong **demand** from communities as well as health system **supply**-related factors accounting for these high intervention rates. Anecdotal information and other individual studies indicate that this issue occurs in many other countries as well. India is well placed to model how improving intrapartum care during induction and augmentation can reduce preventable maternal and newborn morbidity and mortality, and stillbirth.

We suggest the following research, policy, and practice measures:

- **Explore the causes of the guideline–practice gap** related to the national guidance note on the use of uterotonics during labor.

- **Assessment of the impact** of such high rates of augmentation of labor on maternal and fetal outcomes through routine data and special studies in the India context.
- **Behavior change interventions** for communities targeted at raising awareness of risks of augmentation of labor.
- Assess the effectiveness of the **WHO labor care guide to reduce rates of augmentation without medical indication**.


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