

Transcervical Foley's Catheter versus Sublingual Misoprostol for Induction of Labour

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Abstract: Induction of labour is a commonly performed obstetric intervention. Both mechanical and pharmacological methods are widely used, but the optimal method should balance efficacy with maternal and neonatal safety. Transcervical Foley's catheter and misoprostol represent two fundamentally different approaches to cervical ripening and labour induction. **Conclusion:** Sublingual misoprostol is more effective in shortening induction-to-delivery interval, while transcervical Foley's catheter offers a superior safety profile with lower risk of uterine hyper-stimulation. Selection of induction method should be individualised based on maternal condition, fetal status, and availability of monitoring facilities.

Keywords: Induction of labour, Foley catheter, Sublingual misoprostol, Cervical ripening, Bishop score

1. Introduction

Induction of labour (IOL) refers to the deliberate initiation of uterine contractions before spontaneous onset of labour to achieve vaginal delivery. The global rate of induction has steadily increased due to improved antenatal surveillance and identification of high-risk pregnancies. According to the World Health Organisation, approximately one in five pregnancies may require induction due to maternal or fetal indications.

Common clinical indications include postdated pregnancy, hypertensive disorders, diabetes, premature rupture of membranes, fetal growth restriction, and intrauterine fetal demise. Cervical favourability remains a key determinant of successful induction, as an unfavourable cervix increases the likelihood of prolonged labour, failed induction, and cesarean section.

Mechanical methods such as transcervical Foley catheter and pharmacological agents like misoprostol are widely used. These techniques differ in mechanism, safety, cost, and effectiveness. Therefore, comparative evaluation is important for evidence-based obstetric practice.

2. Historical Evolution of Labour Induction

Efforts to initiate labour artificially have been described for centuries. Early approaches included herbal preparations, physical manipulation, and mechanical dilatation. Agents such as castor oil and ergot derivatives were used in traditional medicine to stimulate uterine contractions. However, these methods were unpredictable and associated with maternal and fetal risks.

Mechanical devices like laminaria tents were later introduced to achieve gradual cervical dilatation. Though innovative, these methods carried risks such as infection and trauma.

Modern obstetrics has replaced these approaches with safer pharmacological and mechanical techniques.

The introduction of oxytocin and prostaglandins revolutionized induction of labour. Mechanical methods such as Foley catheter continue to be relevant due to their safety and low cost, especially in low-resource settings.

3. Physiology of Cervical Ripening and Labour

Cervical ripening is a complex biochemical and structural process involving increased hydration, collagen remodelling, and inflammatory changes. Matrix metalloproteinases degrade collagen, resulting in cervical softening and dilatation. Prostaglandins play a major role by promoting enzymatic degradation and inflammatory pathways.

Myometrial contractions depend on intracellular calcium influx and activation of oxytocin receptors. Gap junction formation enhances coordinated uterine activity.

Both Foley catheter and misoprostol influence these physiological pathways through different mechanisms.

4. Mechanical Methods for Induction of Labour

4.1 Transcervical Foley Catheter

The transcervical Foley catheter is a balloon catheter placed beyond the internal os. Inflation with saline exerts direct pressure on the cervix, resulting in:

- Mechanical dilatation
- Separation of membranes
- Release of endogenous prostaglandins
- Cervical ripening

Mechanical methods are widely used due to their safety and minimal systemic effects.

4.2 Advantages

- Reduced risk of uterine hyperstimulation
- Safe in women with previous cesarean section
- Low cost
- Minimal systemic side effects
- Suitable in resource-limited settings

Several randomized trials have shown that Foley catheter is effective for cervical ripening with a favourable safety profile. Studies have demonstrated lower rates of uterine tachysystole compared with prostaglandins.

4.3 Limitations

- Longer induction-delivery interval
- Discomfort during insertion
- Need for oxytocin augmentation
- Risk of infection

Despite these limitations, Foley catheter remains an important option, particularly in high-risk pregnancies.

5. Pharmacological Methods

5.1 Misoprostol

Misoprostol is a synthetic prostaglandin E1 analogue that promotes cervical ripening and uterine contractions. It has become widely used due to its affordability, stability at room temperature, and multiple routes of administration.

Misoprostol induces:

- Collagen breakdown
- Increased cervical compliance
- Uterine contractility
- Oxytocin receptor sensitivity

5.2 Routes of Administration

Misoprostol can be given orally, vaginally, sublingually, or buccally. The sublingual route has gained popularity due to rapid absorption and high bioavailability.

Pharmacokinetic studies have shown that sublingual misoprostol achieves higher peak plasma levels compared to oral or vaginal administration.

6. Sublingual Misoprostol

The sublingual route offers several advantages:

- Rapid onset of action
- Better patient compliance
- Avoids repeated vaginal examination
- Non-invasive
- Suitable in PROM and hypertensive disorders

Randomized trials have demonstrated that sublingual misoprostol is as effective as vaginal misoprostol in achieving cervical ripening and labour progression.

7. Comparative Efficacy of Foley Catheter and Misoprostol

Numerous randomized controlled trials and meta-analyses have compared mechanical and pharmacological methods.

Studies have consistently shown that misoprostol is associated with:

- Faster cervical ripening
- Shorter induction-delivery interval
- Higher likelihood of vaginal delivery within 24 hours

Noor et al. reported that intravaginal misoprostol resulted in significantly shorter induction-delivery interval compared to Foley catheter, though uterine hyperstimulation was more frequent.

However, some studies have reported comparable outcomes between the two methods. Mechanical methods may appear slower initially but eventually achieve similar delivery outcomes.

8. Maternal Outcomes

8.1 Uterine Hyperstimulation

Misoprostol is associated with higher rates of uterine tachysystole and hyperstimulation. These complications may lead to fetal distress and emergency cesarean section.

Foley catheter has a lower risk because it acts locally.

8.2 Postpartum Hemorrhage

Both methods have comparable rates of postpartum hemorrhage. Misoprostol may reduce blood loss due to uterotonic properties.

8.3 Infection

Although Foley catheter carries a theoretical risk of infection, the incidence is low with proper aseptic precautions.

9. Neonatal Outcomes

Studies show that neonatal outcomes are largely similar between the two methods. However, misoprostol has been associated with:

- Increased meconium-stained liquor
- Non-reassuring fetal heart rate
- Slightly higher NICU admission

Overall neonatal morbidity remains comparable.

10. Combination Methods

Combination of Foley catheter with misoprostol has been investigated. Meta-analyses suggest that combined methods may reduce induction time but increase uterine hyperstimulation.

Such strategies require careful monitoring.

11. Role in Low-Resource Settings

In developing countries such as India, both methods are valuable.

Misoprostol is widely used due to:

- Low cost
- Easy storage
- No refrigeration
- Versatility

Foley catheter is preferred where monitoring facilities are limited.

Guidelines from the Federation of Obstetric and Gynaecological Societies of India recommend individualized selection.

12. Current Evidence and Research Gaps

Although multiple trials exist, variability in:

- Dose
- Route
- Parity
- Protocols

Limits Generalisation of results.

There is a need for:

- Standardised dosing
- Regional studies
- Large randomised trials
- Evaluation of combination methods
- Long-term neonatal follow-up

13. Conclusion

Both transcervical Foley catheter and sublingual misoprostol are effective methods for induction of labour. Misoprostol offers faster induction and higher efficiency, whereas Foley catheter provides a safer profile with minimal uterine hyperstimulation.

Individualised selection based on clinical scenario, patient preference, and institutional resources is essential.

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