

Comparative Analysis of Foley Catheter Balloon Volumes (30 ml vs. 60 ml) and Prostaglandin for Labor Induction: Maternal and Neonatal Outcomes



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BACKGROUND

Labor induction is a critical tool in obstetrics, especially when prolongation of pregnancy poses maternal or fetal risks. Mechanical cervical ripening using Foley catheters is commonly employed, particularly in resource-limited settings due to its low cost, accessibility, and safety profile. Despite widespread use, the optimal balloon volume for efficacy and comfort remains unclear. This study compares two commonly used volumes — 30 ml and 60 ml — for their impact on labor progression, delivery outcomes, and patient satisfaction.

OBJECTIVES

To evaluate and compare the maternal and neonatal outcomes associated with 30 ml and 60 ml Foley catheter balloons in primigravid women undergoing labor induction, with emphasis on:

- Bishop score improvement
- Duration of labor
- Mode of delivery
- Need for prostaglandins (PG)
- Maternal satisfaction and safety outcomes

METHODOLOGY

METHODS

Design: Prospective observational study

Setting: Obstetrics Unit, Base Hospital Balangoda

Participants:

43 primigravid women requiring IOL

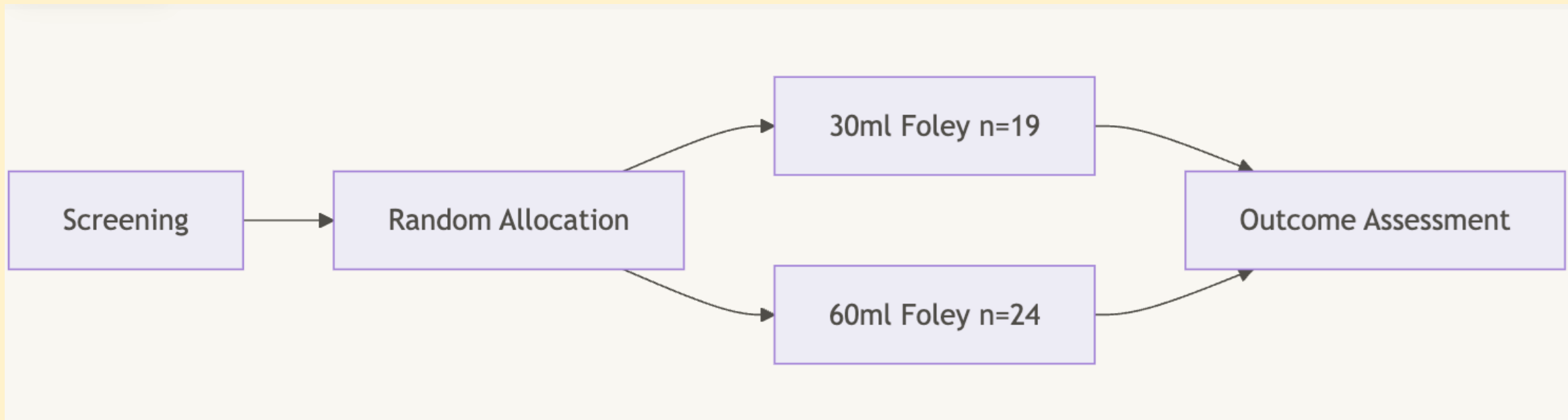
Group A: 30ml Foley catheter (*n*=19)

Group B: 60ml Foley catheter (*n*=24)

Outcomes:

Primary: Bishop score change, vaginal delivery rate

Secondary: Labor duration, PG use, maternal satisfaction (scale: 1–10)

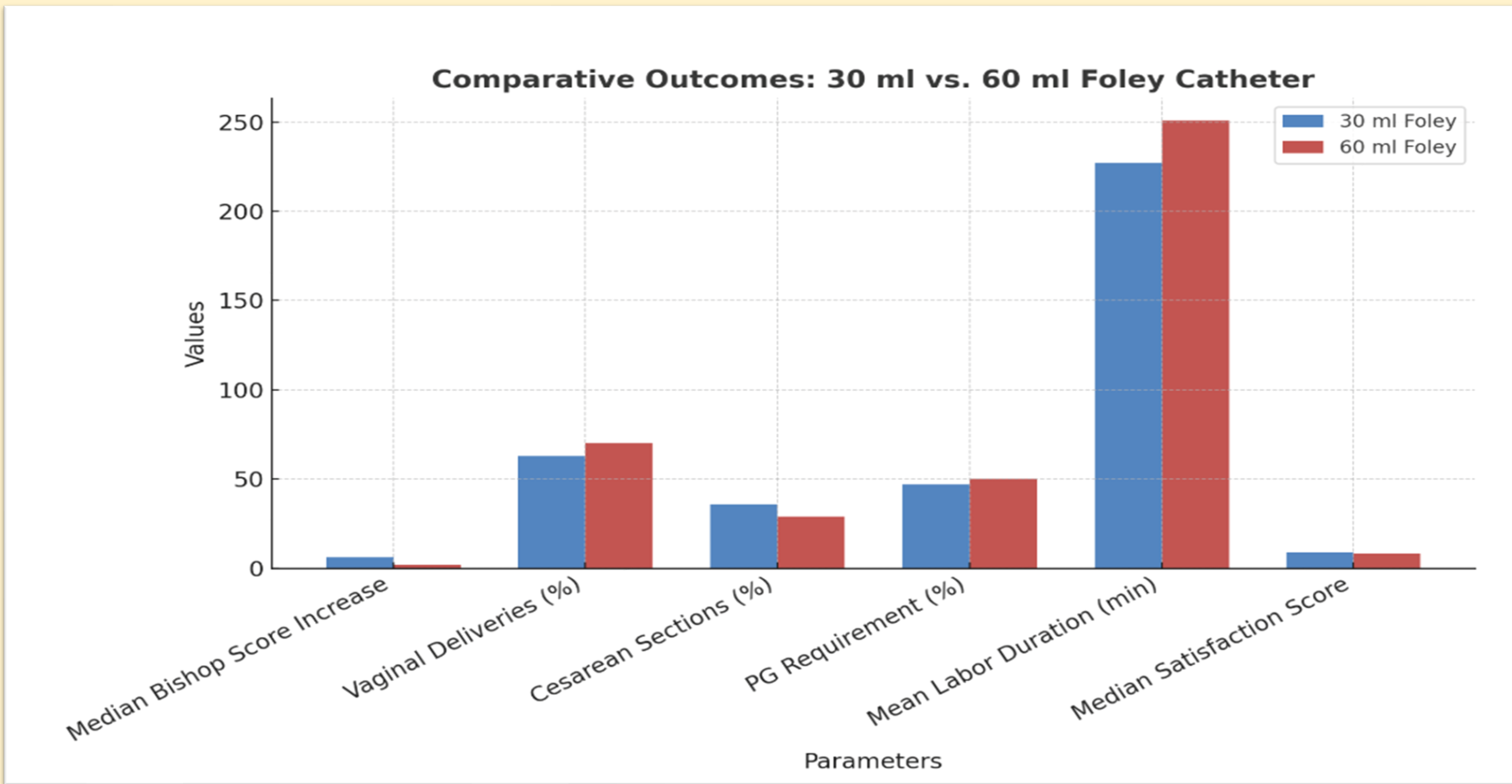


Results

- The 30ml cohort demonstrated clinically and statistically superior performance in cervical ripening, with a median Bishop score improvement of +6 versus +2 in the 60ml group (*p*=0.01).
- Vaginal delivery rates were comparable (63% vs. 70%, *p*=0.60), but the 30ml group experienced 10% shorter labor duration (227 vs. 251 minutes, *p*=0.08) and significantly higher maternal satisfaction (median 9/10 vs. 8/10, *p*=0.03).
- Notably, the 60ml group required 2.2-fold more single-dose prostaglandin augmentation (33% vs. 15%).
- Complication rates were low and statistically equivalent across groups.

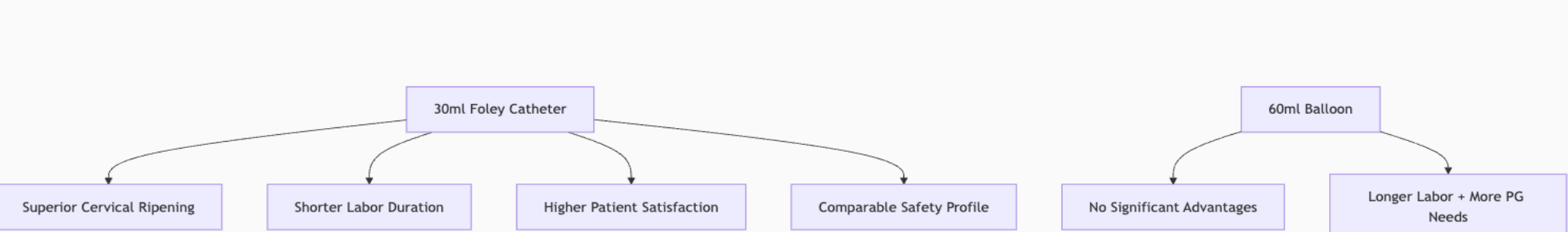
Parameter	30ml Group (n=19)	60ml Group (n=24)
Maternal Age (years)	28 ± 3.2	27 ± 4.1
Gestational Age (weeks)	39.1 ± 0.8	38.9 ± 1.1
Initial Bishop Score	3.4 ± 1.1	3.1 ± 0.9
BMI (kg/m²)	24.7 ± 2.3	25.2 ± 3.0

Parameter	30 ml Foley	60 ml Foley
Bishop Score Increase	+6	+2
Vaginal Delivery Rate	63%	70%
Cesarean Sections	36%	29%
PG Requirement	47%	50%
Mean Labor Duration	227 min	251 min
Satisfaction Score	9/10	8/10



Conclusion and Recommendation

Adopt 30ml as standard Foley volume for labour induction in low-risk primigravidae



Discussion

Cervical Ripening Paradox:

- Despite greater physical distension, 60ml balloons showed *poorer* Bishop score improvement (+2 vs. +6)
- Mechanism: Excessive stretch → cervical edema → impaired remodeling (Levy et al. 2020)

Labor Duration:

- 24-minute reduction with 30ml clinically relevant for resource-limited settings
- Aligns with Ten Eikelder (2016) showing shorter labor with lower-volume balloons

Patient-Centered Outcomes:

- Higher satisfaction with 30ml (9/10 vs. 8/10) linked to:
 - Reduced discomfort during placement
 - Shorter time-to-delivery
 - Lower PG augmentation needs

Safety Profile:

- No volume-dependent increase in complications
- Posterior wall tears (1 case) exclusive to 60ml group

Clinical Implications:

- 30ml as First Choice:** Optimal balance of efficacy and patient comfort
- 60ml Reserved For:** Prior induction failures or clinician discretion

Limitations & Future Research:

Sample size constraints (*n*=43)
Single-center design (external validation needed)
Future: Multicenter RCT including multiparous women

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