



Inpatient Nifedipine Use Prior to Delivery is associated with Increased Risk of Uterine Atony and Use of Secondary Uterotonics: A Retrospective Cohort Study

Amnon A. Berger MD PhD¹, JoAnn Jordan MS, Mohammed Idris MD¹, Philip E. Hess MD^{1,2}, Yunping Li MD^{1,2}, John J. Kowalczyk MD¹

¹Department of Anesthesia, Critical Care and Pain Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School

²Department of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center, Harvard Medical School



Introduction

- Uterine atony is the **leading cause of Postpartum Hemorrhage (PPH)** and a significant cause of maternal mortality.
- Secondary uterotonics are often used following oxytocin when atony is diagnosed.
- Nifedipine, a CCB, is superior in the treatment of hypertensive disorders of pregnancy.¹
- Nifedipine is also a weak tocolytic and could contribute to atony by uterine relaxation.

Impact

- **No large, inpatient trials examined peripartum administration of nifedipine and its association with atony.**
- In a prior small **outpatient trial (n=27)**, nifedipine was not associated with PPH.²
- We examined the association between peripartum nifedipine dosing and uterine atony.

Methods

- Study design: Retrospective, single-center cohort study in a tertiary academic hospital
- Population: All patients who delivered at least one live-born neonate between July 1st, 2016 and June 30th, 2020 (five years)
- Exposure: Nifedipine within 12 hours prior to delivery
- Main outcome: Need for a secondary uterotonic or anti-fibrinolytic (following delivery)
- Secondary outcomes: New post-delivery anemia, transfusion requirement, requirement for an ancillary procedure for hemostasis, Estimated blood loss >1 L
- Statistical methods: Univariate, unadjusted odds ratios (OR), binomial generalized linear models (GLM), propensity matching (PSM) and various sensitivity analyses



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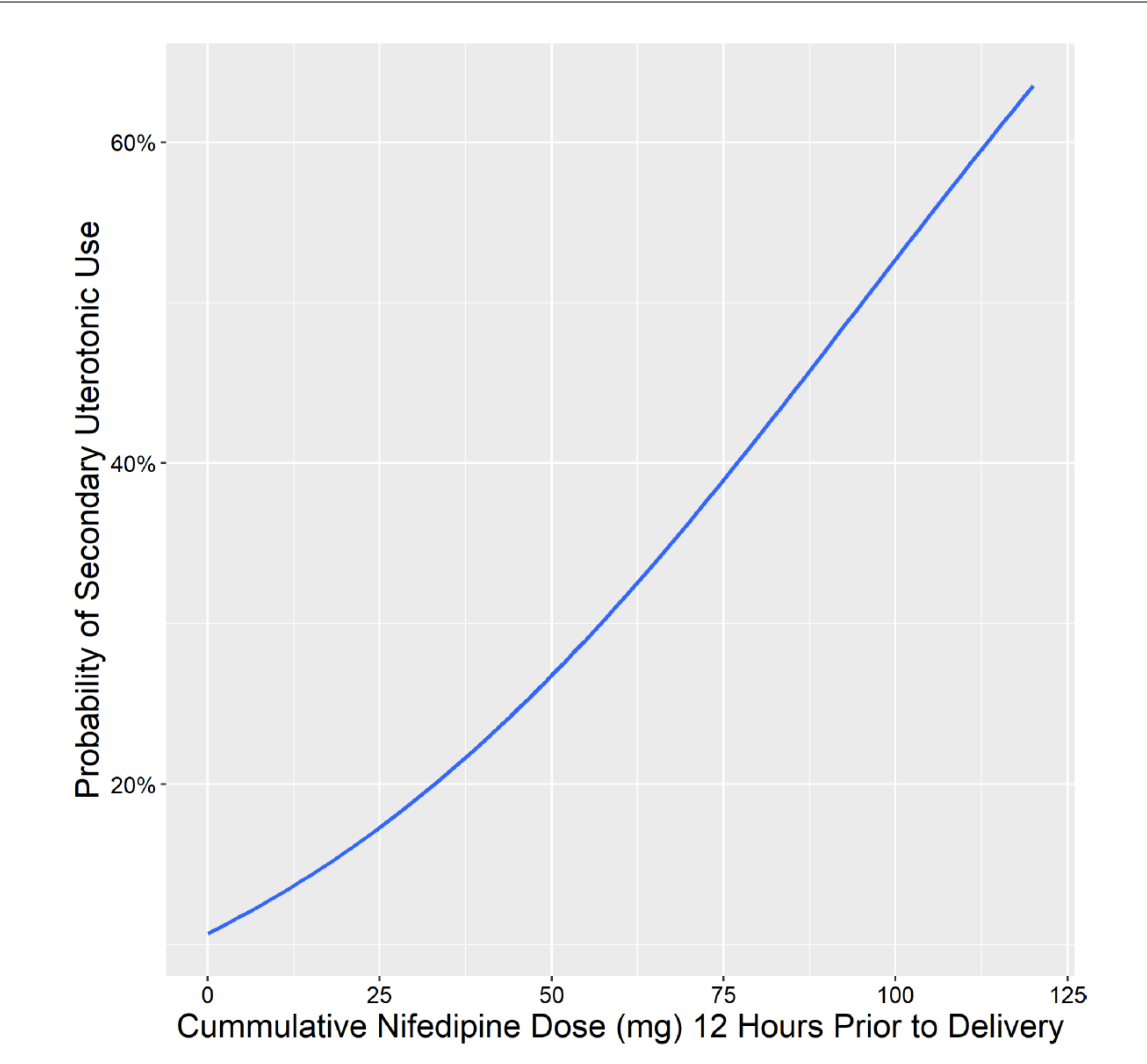


Figure 1: Logistic regression predicting probability of requiring a secondary uterotonic or antifibrinolytic based on cumulative nifedipine dose 12 hours prior to delivery compared to the cohort of all-comers.

Results

- We analyzed 26,058 encounters in 22,480 parturients in the study period
- Unadjusted OR for the 2nd uterotonic use after exposure to nifedipine was 2.72 (112/432 vs. 2,777/24,394, 95% CI 2.19-3.39, p<0.001)
- A GLM controlling for BMI (p<0.001) and neonatal delivery weight (p<0.001) showed significant association between nifedipine exposure and the primary outcome (OR 3.85, 95% CI 2.75-5.35, p<0.001)
- Nifedipine use within 12 hours prior to delivery showed a significant dose-response association (Figure 1)
- In a sensitivity analysis, patients treated with antihypertensives including nifedipine were more likely to experience the primary outcome than those excluding nifedipine (Figure 2)

	aOR ¹	95% CI ²	p-value
Antihypertensive Therapy			
No Nifedipine Exposure	-	-	
Any Nifedipine Exposure	1.75	1.08-2.86	0.025
Age	1.00	0.96-1.05	0.93
BMI	1.00	0.97-1.02	0.78
Delivery Weight	1.00	1.00-1.00	<0.001

¹aOR =adjusted Odds Ratio, ²CI = Confidence Interval

Figure 2: Risk of secondary uterotonic or antifibrinolytic use based on nifedipine exposure in antihypertensive-treated patients, controlling for Age, BMI, and Delivery Weight.



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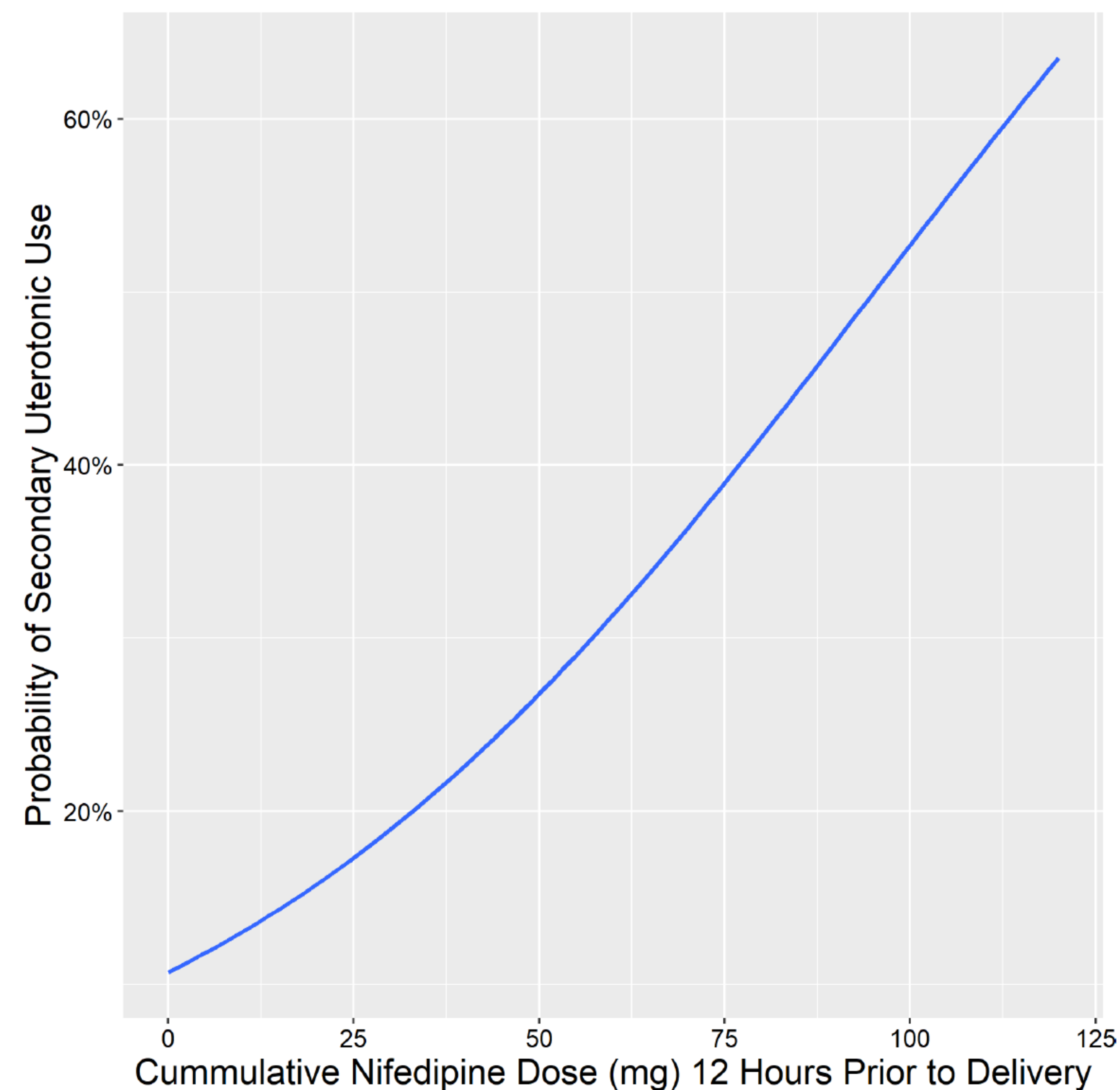


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Discussion

- Uterine atony and PPH remain a cause for maternal morbidity and mortality.
- Nifedipine is used commonly in hypertensive disorders of pregnancy, which itself is increasing in incidence in the Western World.
- We showed a clear association between peripartum nifedipine use and uterine atony, as depicted by requirement for secondary uterotonics.
- Initial evidence suggest there is no increase in PPH with either magnesium or nifedipine or both, potentially owing to the immediate availability and judicious use uterotonics in our facility.
- Further analysis is ongoing into confounders and secondary outcomes.

References

1. BJOG An Int J Obstet Gynaecol 2012;1:78–85
2. BJOG An Int J Obstet Gynaecol 2013;13:1668–77