

EP16.22 Oral misoprostol versus vaginal dinoprostone for labor induction: a systematic review and meta-analysis

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Introduction

- Labor induction is a common obstetric intervention, with rates varying across settings.
- When the cervix is unfavorable, pharmacologic agents are commonly used for cervical ripening and induction.
- Vaginal dinoprostone (PGE2) is widely used but requires refrigeration, is relatively costly, and requires vaginal/intracervical administration.
- Oral misoprostol (PGE1) is inexpensive, thermostable, and easy to administer.
- Previous reviews have compared these agents but often pooled different routes of misoprostol administration or lacked rigorous assessment of risk of bias, certainty of evidence, and subgroup-effect credibility.

Objectives

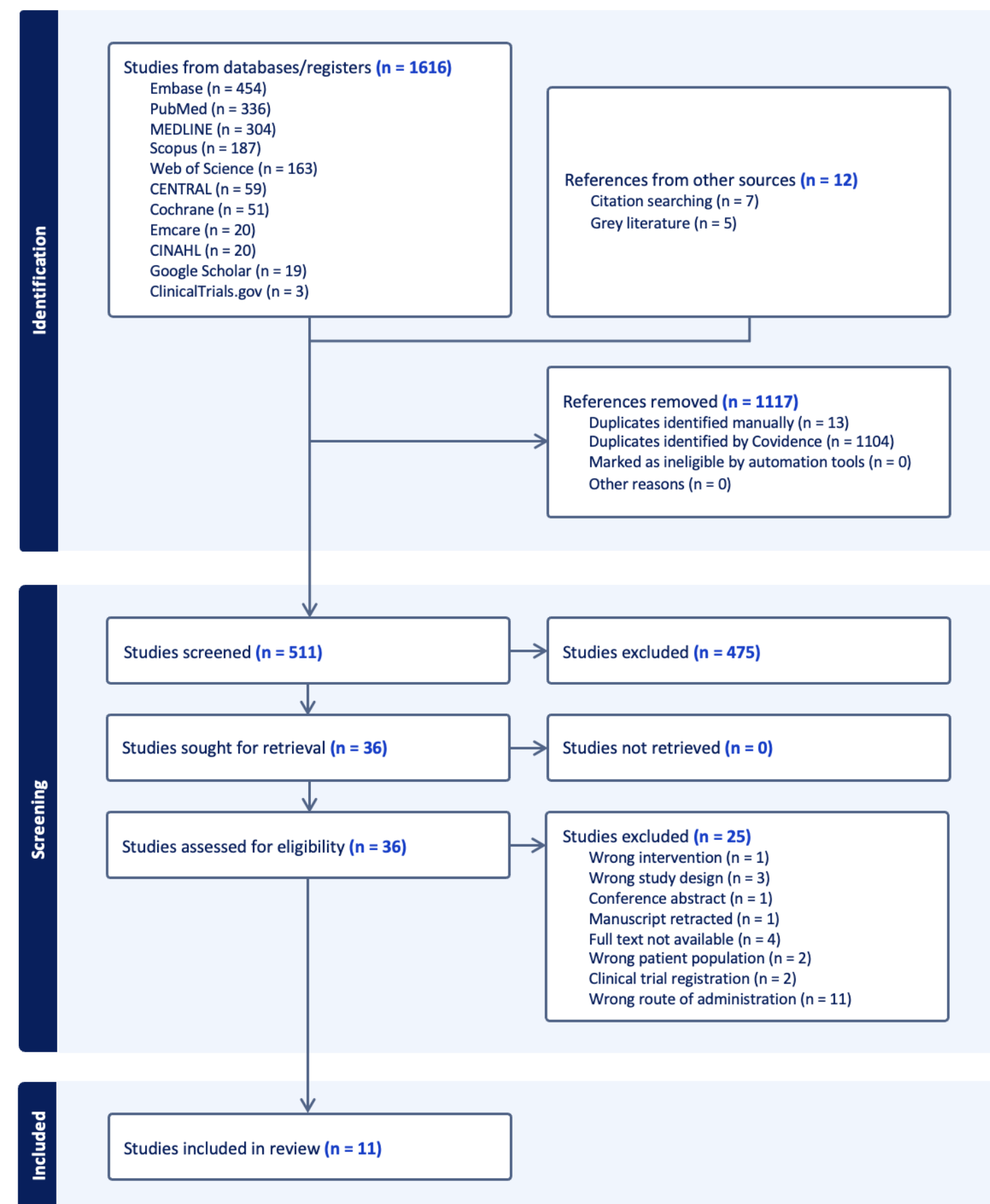
- Pharmacologic cervical ripening is frequently used for labor induction, yet the comparative effectiveness, safety, and resource utilization of available agents remain uncertain.
- This review compared oral misoprostol with vaginal dinoprostone for labor induction in singleton pregnancies at ≥ 34 weeks' gestation.

Methods

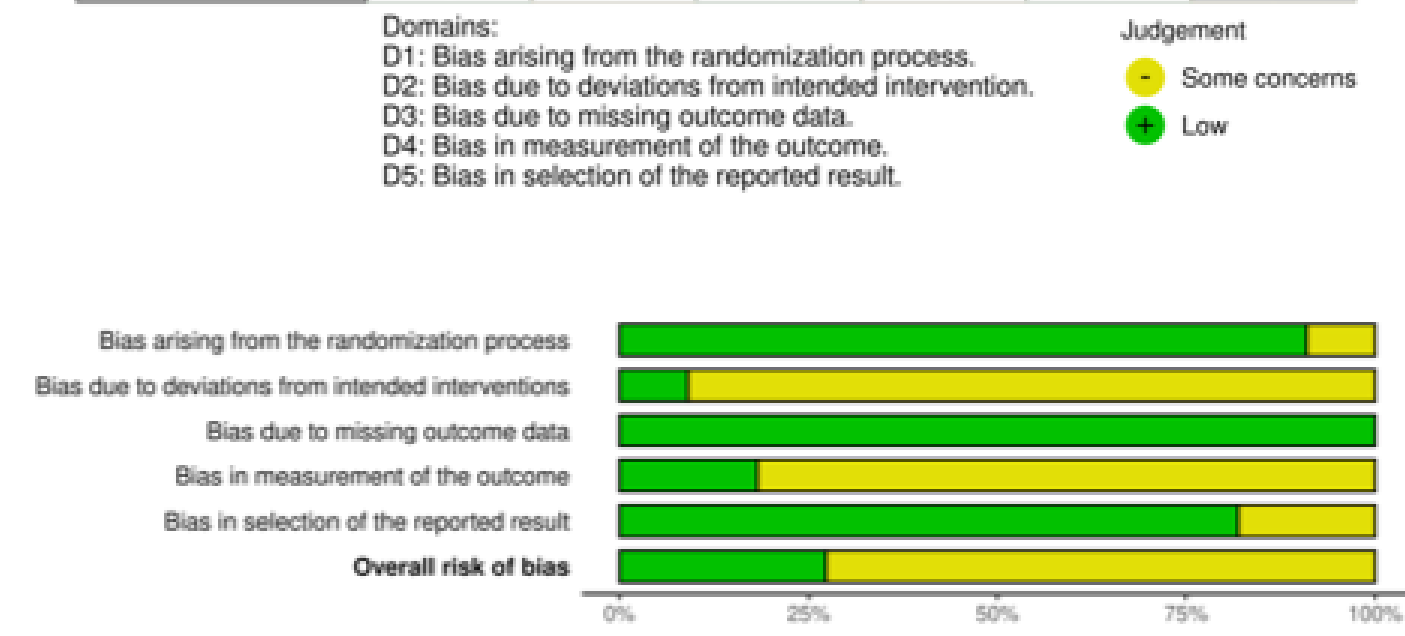
- A systematic review and meta-analysis of randomized controlled trials was conducted until May 2025.
- Eligible studies compared oral misoprostol with vaginal dinoprostone in singleton pregnancies ≥ 34 weeks undergoing induction without contraindication to vaginal birth.
- Seven critical outcomes were assessed:
 - Cesarean birth
 - Uterine hyperstimulation
 - 5-minute Apgar score < 7
 - Neonatal Intensive Care Unit (NICU) admission
 - Oxytocin augmentation
 - Vaginal birth within 24 hours
 - Induction-to-birth interval
- Study selection and data extraction were performed in duplicate.
- Random-effects meta-analysis was applied, with risk of bias, certainty of evidence, and subgroup credibility assessed using Cochrane RoB 2.0, GRADE, and ICEMAN.

Results

- Eleven trials including 3783 participants were analyzed.
- Oral misoprostol was associated with lower cesarean birth (RR 0.83, 95% CI 0.74–0.94) and reduced oxytocin augmentation (RR 0.89, 95% CI 0.82–0.97).
- Vaginal dinoprostone was associated with higher vaginal birth within 24 hours (RR 0.91, 95% CI 0.86–0.96) and a shorter induction-to-birth interval.
- No significant differences were observed in uterine hyperstimulation, 5-min Apgar score < 7 , or NICU admission.



	Risk of bias domains					
	D1	D2	D3	D4	D5	Overall
Hofmeyr 2001	+	+	+	-	-	-
leRoux 2002	+	-	+	-	-	-
Dällenbach 2003	+	+	+	-	+	+
Matonhodze 2003	+	-	+	-	+	+
Shetty 2004	+	+	+	-	+	-
Dodd 2006	+	+	+	+	+	+
Henrich 2008	+	+	+	-	+	-
Rouzi 2014	+	-	+	-	+	-
Ilyas 2016	-	-	+	+	+	-
Wang 2016	+	-	+	-	+	-
Young 2020	+	-	+	-	+	-



Caesarean birth					
Study	Oral misoprostol (n)	Vaginal dinoprostone (n)	Weight	RR [95% CI]	
Hofmeyr 2001	56345	68347	18.6%	0.83 [0.66, 1.11]	
leRoux 2002	38120	82040	12.6%	0.95 [0.7, 1.3]	
Dällenbach 2003	18100	19100	4.4%	0.95 [0.53, 1.7]	
Matonhodze 2003	24176	43176	9.9%	0.95 [0.55, 1.68]	
Shetty 2004	25100	27100	6.2%	0.93 [0.68, 1.48]	
Dodd 2006	83065	100376	22.7%	0.88 [0.66, 1.1]	
Henrich 2008	8924	2112	11.8%	0.9 [0.55, 1.44]	
Rouzi 2014	980	1880	2.2%	0.9 [0.24, 1.05]	
Ilyas 2016	950	1050	2.3%	0.9 [0.4, 2.02]	
Wang 2016	30122	36199	18.1%	0.78 [0.5, 1.22]	
Young 2020	50167	57172	13.0%	0.89 [0.73, 1.38]	
Pooled Estimate	3471827	4621562	23.7%	0.83 [0.74, 0.94]	

Uterine hyperstimulation					
Study	Oral misoprostol (n)	Vaginal dinoprostone (n)	Weight	RR [95% CI]	
Hofmeyr 2001	13238	10234	13.4%	1.22 [0.82, 2.08]	
leRoux 2002	9100	14100	14.0%	0.64 [0.29, 1.42]	
Dällenbach 2003	7161	8164	4.9%	0.89 [0.33, 2.4]	
Shetty 2004	2160	9160	0.7%	5.0 [0.35, 102.65]	
Dodd 2006	3065	6376	1.6%	0.52 [0.13, 2.04]	
Henrich 2008	9112	1112	0.0%	1.0 [0.02, 49.96]	
Rouzi 2014	780	690	0.7%	1.4 [0.46, 4.23]	
Wang 2016	5212	18199	9.0%	0.28 [0.1, 0.68]	
Young 2020	8167	12172	7.0%	0.69 [0.25, 1.84]	
Pooled Estimate	541825	731637	4.5%	0.74 [0.53, 1.04]	

Apgar Score < 7 at 5 minutes					
Study	Oral misoprostol (n)	Vaginal dinoprostone (n)	Weight	RR [95% CI]	
Hofmeyr 2001	15366	10366	14.3%	0.74 [0.34, 1.58]	
leRoux 2002	2120	2240	2.9%	2.0 [0.29, 14.03]	
Dällenbach 2003	1700	2100	2.0%	0.5 [0.05, 5.43]	
Matonhodze 2003	4713	9715	6.1%	0.87 [0.25, 3.08]	
Dodd 2006	2065	6376	1.3%	0.41 [0.08, 2.11]	
Henrich 2008	1112	1112	2.2%	1.0 [0.06, 15.78]	
Rouzi 2014	1080	780	0.8%	1.43 [0.57, 3.57]	
Wang 2016	3212	3189	8.8%	0.84 [0.18, 4.4]	
Young 2020	4167	2172	1.2%	2.06 [0.38, 11.1]	
Pooled Estimate	401875	461803	2.6%	0.9 [0.6, 1.36]	

Admission to neonatal intensive care unit					
Study	Oral misoprostol (n)	Vaginal dinoprostone (n)	Weight	RR [95% CI]	
Hofmeyr 2001	9245	14240	17.0%	0.8 [0.28, 1.47]	
leRoux 2002	2120	8240	3.3%	0.5 [0.11, 2.32]	
Dällenbach 2003	7100	10100	10.0%	0.7 [0.28, 1.77]	
Matonhodze 2003	3174	3174	3.8%	1.0 [0.1, 4.91]	
Shetty 2004	12100	12100	12.0%	1.0 [0.47, 2.12]	
Dodd 2006	5365	2376	0.9%	2.58 [0.5, 13.19]	
Henrich 2008	9112	11112	11.0%	0.5 [0.25, 1.16]	
Rouzi 2014	680	680	0.0%	13.0 [0.74, 228.98]	
Wang 2016	15212	15199	7.5%	0.94 [0.47, 1.87]	
Young 2020	58188	811728	4.7%	0.87 [0.64, 1.19]	
Pooled Estimate	141808	111728	4.7%	0.87 [0.64, 1.19]	

Oxytocin augmentation					
Study	Oral misoprostol (n)	Vaginal dinoprostone (n)	Weight	RR [95% CI]	
Hofmeyr 2001	90345	114346	18.4%	0.44 [0.33, 0.59]	
leRoux 2002	20120	39240	4.2%	1.03 [0.63, 1.68]	
Dällenbach 2003	33100	53100	8.5%	0.62 [0.45, 0.87]	
Matonhodze 2003	24176	43176	9.9%	0.28 [0.15, 0.48]	
Shetty 2004	46100	47100	7.6%	1.28 [0.98, 1.66]	
Dodd 2006	203065	179376	47.6%	1.17 [1.02, 1.34]	
Henrich 2008	41776	2346	2.3%	0.82 [0.51, 1.36]	
Rouzi 2014	32182	26163	17.2%	1.02 [0.65, 1.62]	
Wang 2016	117167	113172	65.7%	1.07 [0.92, 1.23]	
Young 2020	5471391	6891719	97.2%	0.89 [0.82, 0.97]	
Pooled Estimate	756167	821172	7.7%	0.86 [0.75, 1.19]	

Vaginal birth within 24 hours					
Study	Oral misoprostol (n)	Vaginal dinoprostone (n)	Weight	RR [95% CI]	
Hofmeyr 2001	213345	223340	63.9%	0.96 [0.86, 1.08]	
leRoux 2002	47120	131240	54.6%	0.72 [0.56, 0.92]	
Dällenbach 2003	56100	62100	62.0%	0.9 [0.72, 1.14]	
Matonhodze 2003	78176	78176	28.8%	1.0 [0.77, 1.29]	
Shetty 2004	46100	47100	47.0%	0.88 [0.73, 1.32]	
Dodd 2006	197265	221276	58.8%	0.92 [0.81, 1.04]	
Henrich 2008	55112	76112	66.1%	0.74 [0.58, 0.94]	
Rouzi 2014	5680	4480	55.0%	1.27 [1.0, 1.63]	
Wang 2016	118182	131163	60.4%	0.81 [0.71, 0.92]	
Young 2020	756167	821172	67.7%	0.98 [0.75, 1.19]	
Pooled Estimate	9331748	10851868	58.1%	0.91 [0.86, 0.96]	

Induction to vaginal birth					
Study	Oral misoprostol (N)	Vaginal dinoprostone (N)	Weight	MD [95% CI]	
Shetty 2004	28.03 $\pm$ 19.5	29.0 $\pm$ 21.0	2.6%	-0.97 [-6.39, 4.65]	
Rouzi 2014	10.33 $\pm$ 18.5	10.0 $\pm$ 18.0	4.4%	-2.6 [-6.96, 1.76]	
Ilyas 2016	10.33 $\pm$ 1.93	15.5 $\pm$ 3.45	50%	-5.17 [-6.27, -4.07]	
Wang 2016	21.3 $\pm$ 14.5	15.7 $\pm$ 9.6	199%	5.6 [3.24, 7.96]	
Young 2020	22.6 $\pm$ 17.21	19.7 $\pm$ 10.21	172%	2.87 [1.53, 5.43]	
Pooled Estimate			91.1%	-2.66 [-3.57, -1.74]	

Conclusions

- Oral misoprostol is associated with reduced cesarean birth and probably reduces the need for oxytocin augmentation.
- Vaginal dinoprostone is associated with higher rates of vaginal birth within 24 hours and probably a shorter induction-to-birth interval.
- Maternal and neonatal safety outcomes appear comparable.
- These findings support consideration of oral misoprostol in selected populations and settings, while acknowledging underlying clinical and methodological heterogeneity.