

Evening Primrose versus Misoprostol for Cervical Dilatation before Gynecologic Surgeries; a Double-blind Randomized Clinical Trial

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ABSTRACT

Background & Objective: Cervical ripening/dilatation is necessary for gynecologic procedures, but pharmacological dilators have several adverse effects. In this regard, evening primrose oil (EPO) has been shown as an effective dilator, though it has few complications. This randomized clinical trial (RCT) aimed to compare the effect of EPO and misoprostol on cervical ripening/dilatation.

Materials & Methods: In this double-blind RCT study, women of reproductive age without history of normal vaginal delivery (NVD) and menopause women (age range: 20–75 years) were enrolled. The subjects who were candidates of hysteroscopy, dilatation, and curettage were randomly assigned into two groups. In one group, 2 capsules of 500 mg EPO (N=81) and in the other group 2 capsules of 200 µg misoprostol (N=84) were placed in posterior fornix 2 hours before surgery. The time to reach complete dilatation (Hegar 3 to 10 mm), size of the first Hegar used to apply force, bleeding volume, and cervical laceration were compared between the groups using the IBM SPSS Statistics for Windows, Version 21.0 (Armonk, NY: IBM Corp).

Results: The two study groups had similar demographic information, number of pregnancies, cesarean sections, and NVDs ($P>.05$), but had different frequency of surgical types ($P=.018$). EPO group had a larger mean size of the Hegar (7.32 vs. 6.58 mm; $P=.004$) and shorter time to reach complete dilatation (242.35 vs. 331.79 min; $P=.002$); however, bleeding volume and frequency of cervical laceration were not different between the groups (1.41 vs. 2.00 cc and 8.6% vs. 14.3%, respectively; $P>.05$).

Conclusion: The superiority of EPO capsules to misoprostol for cervical ripening before gynecologic procedures in women of reproductive age without history of normal NVD and menopause women suggests it as an appropriate alternative to misoprostol.

Keywords: Cervical ripening, Evening primrose oil, Misoprostol



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Introduction

Cervical ripening/dilatation is one of the initial steps required in several gynecologic procedures, such as hysteroscopy, dilatation and curettage (D&C), and labor induction (1, 2). Several methods are used for induction of cervical ripening/dilatation, including mechanical methods, like the use of expanding balloon and Foley catheters (3), as well as medical treatment, which mainly include prostaglandins (PGs), like misoprostol, an analogue of PGE₁. PGs are naturally produced in the cervix and uterus and can dilate the cervix by activation of collagenase and remodeling the extracellular matrix (4). Although the efficacy of misoprostol has been confirmed and it is considered as one of the most commonly used methods for cervical

ripening/dilatation (5), life-threatening complications have been reported for it, such as dose-dependent myometrial contractility, which may cause uterine tachysystole, hyper systole, or hyper tonus uterine, and uterine hyperstimulation syndrome during labor (6). Therefore, routine use of misoprostol before every hysteroscopy is not suggested and it should be used for selected cases by consideration of patients' medical history and clinical characteristics (7).

Evening primrose is a plant native to Europe and North America with yellow flowers and its oil, extracted from the seeds, is used for different clinical purposes (8, 9). Considering the effect of evening primrose oil (EPO) on cervical ripening during labor,

some studies have shown the efficacy of EPO (10), EPO plus misoprostol vs. misoprostol plus placebo (11), as well as EPO vs. placebo (12) in women with post-term pregnancy, while such efficacy has been rejected for oral EPO capsules (1000 mg for 14 days)(13) and oral EPO capsules (2 capsules of 1000 mg for 7 days) (14), compared to placebo. Considering the effect of EPO on cervical dilatation before hysteroscopy procedure, studies comparing vaginal soft gels of EPO with placebo have confirmed the efficacy of vaginal EPO for cervical ripening and have suggested it as an appropriate cervical priming agent to be used prior to gynecologic procedures (15, 16). Also, 1000 mg oral EPO was found to be as effective as 500 mcg intracervical dinoprostone gel for cervical priming before hysteroscopy (17). Several studies (11, 12, 15-17) have confirmed the effectiveness of vaginal EPO on cervical ripening/dilatation; however, this herbal plant has not been validated as an appropriate alternative to misoprostol. Considering the adverse events and complications of misoprostol (6), this issue is worth studying. Therefore, this randomized clinical trial (RCT) aimed to compare the effect of EPO and misoprostol on the cervical ripening/dilatation and post-treatment complications/adverse effects.

Materials and Methods

Study design

This study was a double-blind RCT with parallel design and allocation ratio of 1:1. The study protocol was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences (code: IR.SBMU.RETEACH.REC1397.1293). Women of reproductive age without history of normal vaginal delivery (NVD) (nulliparous non-menopause women) and menopause women, within the age range of 20–75 years, candidate of gynecologic surgical procedures, requiring cervical dilatation, such as hysteroscopy, dilatation and curettage (D&C), and laparoscopic hysterectomy were included in the study. Women with structural anomalies of cervix, müllerian anomalies, history of conization, or any contraindications of EPO or misoprostol were not included in the study. After selecting the eligible patients, the researcher explained the study design and objectives, as well as the possible adverse effects of both drugs to the patients and requested them to read and sign a written informed consent. Only those who were willing to participate were included in the study and all principles of the latest version of Helsinki's declaration on human studies were met throughout the study.

The sample size of this study was calculated at 85 in EPO group and 88 in misoprostol group based on the results of a pilot study on 20 patients.

The included participants were randomly assigned into two groups using simple randomization method (computer-generated numbers between 0 and 1; numbers <0.5 were assigned to the intervention group and numbers ≥ 0.5 to the control). In one group, 2 capsules of 500 mg EPO (prepared by Nutricenter Co.) and in the other group, 2 capsules of 200 μ g misoprostol (purchased from Abureyhan Co., Iran) were placed in the posterior vaginal fornix 2 hours before surgery. The drugs were administered by the resident based on the randomization numbers; therefore, neither the drug administrator nor the patients and medical staff were aware of the study groups. Then, the patients underwent scheduled surgical procedures after general anesthesia.

The primary outcome of this study was calculated by the interval between insertion of Hegar size 3 to 10, as well as the first Hegar inserted with force; the secondary outcome was evaluation of the complications, calculated by the bleeding volume and cervical laceration. Any other adverse effects of the drugs, such as nausea/vomiting, diarrhea, fever, and severe abdominal pain were collected using a checklist. The patients' demographic information, including age and body mass index (BMI), medical history, including number of pregnancies and cesarean sections, and the type of surgery, and history of vaginal delivery were also collected from their medical records and recorded in the checklist. Patients who had cervical stenosis and required using additional methods, patients with an interval of >2 hours between drug administration and initiation of surgery, and patients unwilling to continue the study were excluded from the study (Figure 1).

Statistical analysis

Results of qualitative variables were described by frequency (percentage) and compared between the groups using chi-square test. For quantitative variables, first One-sample Kolmogorov-Smirnov test was used to evaluate the normal distribution of the data and Levene's test was used to test the equality of variances. Based on the results of these tests, quantitative variables were described by mean \pm standard deviation (SD) and compared between the two study groups using independent samples *t* test in cases with normal distribution, or Mann-Whitney U test whenever the data did not appear to have normal distribution or when the assumption of equal variances was violated across the study groups. For the statistical analysis, the IBM SPSS Statistics for Windows version 21.0 (IBM Corp. 2012. Armonk, NY: IBM Corp) was used. P values <.05 were considered as statistically significant.

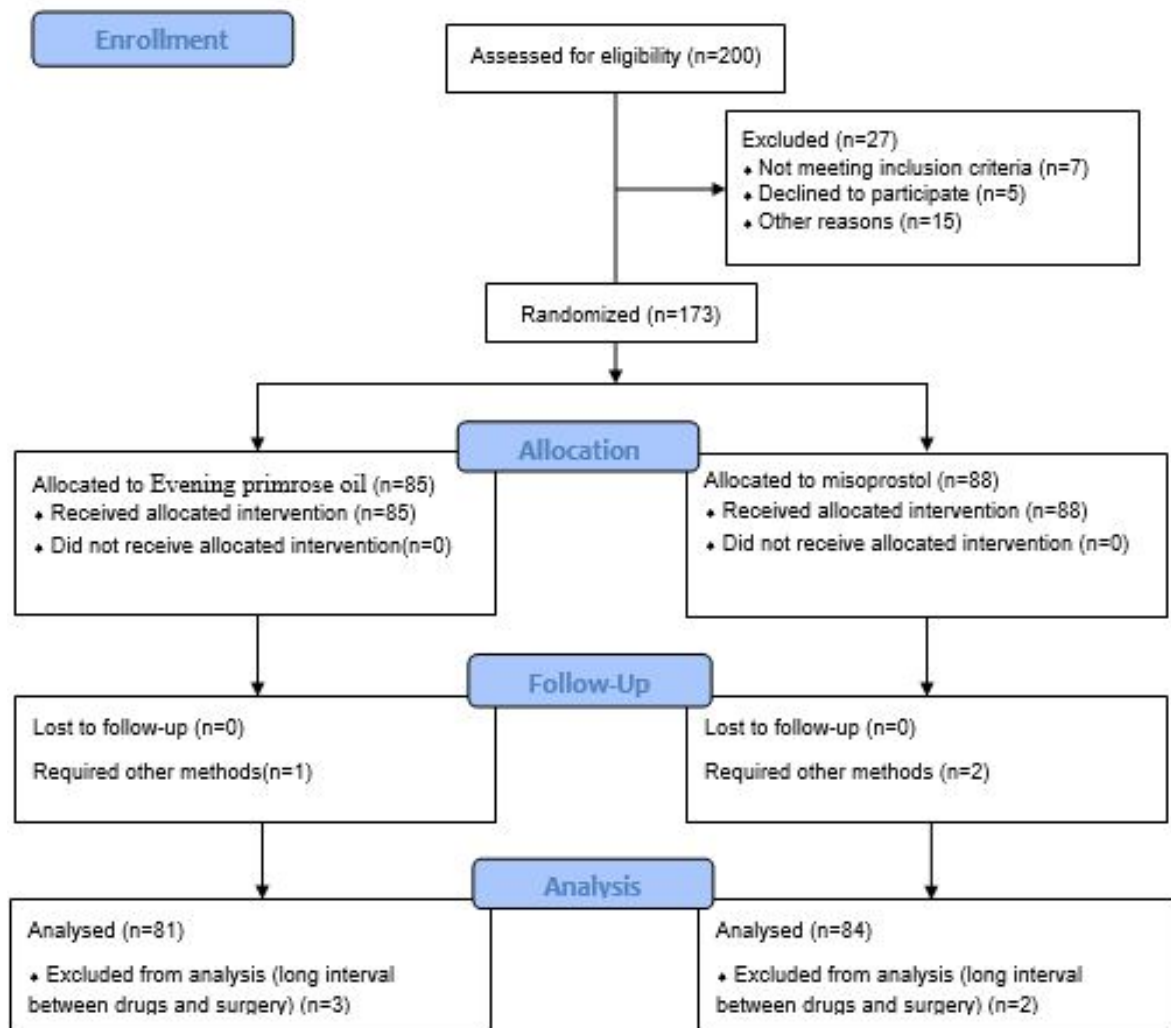


Figure 1. The flow diagram of the studied patients

Results

As shown in [Table 1](#), the demographic characteristics, including mean age, BMI, number of pregnancies, frequency of cesarean sections, NVDs, and menopause women were not statistically different between the two study groups ($P > 0.5$). The frequency of different surgical types was statistically different between the groups ([Table 1](#)). All quantitative variables based on One-sample Kolmogorov-Smirnov test were normally distributed.

The mean size of the first Hegar inserted with force was different between the groups. It was significantly larger in the EPO group ($P = .004$) and shorter time to reach complete dilatation. Also it was significantly shorter in the EPO group, compared to misoprostol group ($P = .002$), while the bleeding volume and frequency of cervical laceration were not different between the groups ($P > .05$; [Table 2](#)).

We categorized the subjects to menopause and nulliparous non-menopause women for subgroup analysis, and the results showed that the mean time to reach complete dilatation, size of the first Hegar

inserted with force, bleeding volume, and frequency of cervical laceration were different between the groups of EPO or misoprostol in non-menopause women ($P < 0.5$; [table 2](#)). Among menopause patients, the mean size of the first Hegar inserted with force was significantly larger in EPO group ($P = .024$) and the mean time to reach complete dilatation was significantly shorter in EPO group compared to misoprostol group ($P = .042$), while the bleeding volume and frequency of cervical laceration were not different between the groups ($P > .05$; [Table 2](#)).

We also studied the surgical outcomes among patients without NVD; the results showed that the mean size of the first Hegar inserted with force was significantly larger in EPO group ($P = .024$) and the mean time to reach complete dilatation was shorter in EPO group compared to misoprostol group ($P = .042$), while the bleeding volume and frequency of cervical laceration were not different between the groups ($P > .05$; [Table 2](#)).

The adverse effects included 3 cases of severe abdominal pain, 2 cases of diarrhea, and one case of

fever, all in misoprostol group, while there were no adverse effects reported in the EPO group ($P=0.029$).

Table 1. Comparing the demographic characteristics, medical history, and type of surgery of the two study groups, receiving either Primrose or Misoprostol

	Total	Group		p-value	
		Primrose	Misoprostol		
Age (years), mean \pm SD	35.80 \pm 12.67	35.41 \pm 11.77	36.19 \pm 13.53	.693*	
Body mass index (kg/m ²), mean \pm SD	26.27 \pm 5.24	26.06 \pm 5.21	26.49 \pm 5.29	.603*	
Number of pregnancies, mean \pm SD	1.03 \pm 1.16	.90 \pm 1.13	1.15 \pm 1.18	.163*	
Number of cesareans, mean \pm SD	.78 \pm 1.04	.73 \pm 1.06	.83 \pm 1.04	.522*	
Type of surgery	Dilatation and curettage	41 (24.8%)	12 (14.8%)	29 (34.5%)	.018 [†]
	Hysteroscopy	27 (16.4%)	17 (21.0%)	10 (11.9%)	
	Laparoscopic hysterectomy	74 (44.8%)	38 (46.9%)	36 (42.9%)	
	Other	21 (12.7%)	14 (17.3%)	9 (10.7%)	
Cesarean section, No. (%)	31 (38.3%)	37 (44.0%)	68 (41.2%)	.451 [†]	
Normal vaginal delivery, No. (%)	23 (13.9%)	9 (11.1%)	14 (16.7%)	.303 [†]	
Menopause participants, No. (%)	28 (17.0%)	13 (16.0%)	15 (17.9%)	.757 [†]	

*The results of independent samples t test; [†]The results of chi square test; [‡]

Table 2. Comparing the surgical outcomes between different study groups

Patients	Variable	Group		p-value
		Primrose	Misoprostol	
Total	Size of Hegar (mm), mean \pm SD	7.32 \pm 1.61	6.58 \pm 1.62	.004*
	Bleeding volume (cc), mean \pm SD	1.41 \pm 2.71	2.00 \pm 2.89	.177*
	Time to reach complete dilatation (sec), mean \pm SD	242.35 \pm 157.49	331.79 \pm 205.56	.002*
	Cervical laceration, No. (%)	7(8.6)	12(14.3)	.256 [†]
Non-menopause	Size of Hegar (mm), mean \pm SD	7.19 \pm 1.62	6.64 \pm 1.50	.040*
	Bleeding volume (cc), mean \pm SD	1.34 \pm 2.37	2.35 \pm 3.07	.034*
	Time to reach complete dilatation(sec), mean \pm SD	248.97 \pm 159.70	326.67 \pm 206.19	.015*
	Cervical laceration, No. (%)	5(7.4)	12(17.4)	.044 [†]

Patients	Variable	Group		p-value
		Primrose	Misoprostol	
Menopause (N=28)	Size of Hegar (mm), mean \pm SD	7.96 \pm 1.45	6.30 \pm 2.11	.024*
	Bleeding volume (cc), mean \pm SD	1.77 \pm 4.14	.40 \pm .63	.217*
	Time to reach complete dilatation(sec), mean \pm SD	207.69 \pm 146.35	355.33 \pm 208.05	.042*
	Cervical laceration, No. (%)	2(15.4)	0	.206 [†]
Without vaginal delivery (N=142)	Size of Hegar (mm), mean \pm SD	7.26 \pm 1.62	6.58 \pm 1.49	.011*
	Bleeding volume (cc), mean \pm SD	1.49 \pm 2.81	2.24 \pm 3.06	.127*
	Time to reach complete dilatation(sec), mean \pm SD	245.00 \pm 156.38	327.57 \pm 207.01	.008*
	Cervical laceration, No. (%)	7(9.7)	11(15.7)	.283 [†]

*The results of independent samples t test; [†]The results of chi square test; [‡]

Discussion

In this study, the results of comparing EPO with misoprostol between two randomized groups with similar characteristics showed that 2 capsules of 500 mg EPO placed in the posterior fornix 2 hours before surgery was more effective than 2 capsules of 200 μ g misoprostol in cervical dilatation of hysteroscopy procedures, D&C, etc. and resulted in a larger Hegar inserted with force and shorter time to reach complete dilatation, while the complication rates (bleeding volume and frequency of cervical laceration) were similar. These results confirmed the superiority of EPO to misoprostol for cervical ripening/dilatation before gynecologic surgical procedures.

In a pilot study, intravaginal administration of EPO (two soft gels of 1000 mg) 4–6 hours before hysteroscopy resulted in cervical dilation of 7 mm with ease without adverse reactions and uterine cervicovaginal complications in 6 postmenopausal and 2 nulligravida premenopausal women (16). This pilot study confirmed the efficacy of EPO as a cervical priming agent, which is consistent with the results of the present study. However, the main limitations of the mentioned study were the sample size and lack of comparison with another group. In another study, Marian *et al.* randomized 43 patients to EPO (N=24) and placebo (N=18) groups and the results showed that EPO resulted in 7.81 mm cervical dilation, only 47% required any dilatation, and Hegar size 10 could be inserted after 17.43 seconds, while placebo only caused 4.33 mm cervical dilation, all required further dilatation, and Hegar size 10 could be inserted after 53.56 seconds (18). The mean cervical dilation in this study was comparable to that of the present study, as mean size of Hegar was

7.32 mm in EPO group of our study, which confirmed the efficacy of vaginal EPO for cervical ripening/dilatation before gynecologic surgical procedures; nevertheless, the study designs were different, as we compared the results with misoprostol. In another study, Vahdat *et al.* randomized nulliparous non-menopausal women and menopause women to two soft gels of 500 mg EPO (N=28) and placebo (N=22), and placed in the posterior vaginal fornix 6–8 hours before hysteroscopy; the results showed that EPO resulted in a shorter time to reach complete dilation (Hegar size 10 mm) and a larger Hegar inserted with force, compared to placebo (15). In their study, the mean time to reach complete dilatation was 33.5 seconds in EPO group and the mean size of Hegar was 8 mm, vs. 75 sec and Hegar size 7 mm in placebo group (15). These results confirmed the efficacy of EPO for cervical dilatation before hysteroscopy, which were generally consistent with the results of the present study. However, the compared group in our study was misoprostol, and not placebo, and we included a variety of gynecologic surgeries. The effect of EPO on cervical ripening/dilatation can be attributed to the fact that EPO is identified as precursor of PGE₁ and E₂, and can thus relax the smooth muscles and change the cervical vascular tone and consistency (19).

Researchers have also compared the effect of 6 soft capsules of EPO 6 hours before and 4 capsules 1 hour before hysteroscopy with luminaria (osmotic dilatation) on the ease of cervical dilation and reported the cervical dilation at 117 seconds with mean dilation of 7 mm and no pain in EPO group, which confirmed the superiority of EPO to luminaria (20). The results of this study are

consistent with that of the present study on the efficacy of vaginal EPO for cervical dilation before hysteroscopy, although the comparison group and the administered dose were different. We compared EPO with misoprostol for two reasons; firstly, because misoprostol is the most widely used medical agent for cervical dilation before gynecologic procedures (21, 22); and secondly, because of the shared mechanism between EPO and misoprostol, as misoprostol is the synthetic analog of PGE₁ (23) and EPO is identified as precursor of PGE₁ and E₂ (19). The results of this comparison in the current study confirmed the greater efficacy of EPO compared to misoprostol. Other studies have also compared cervical dilatation and complications of misoprostol with other dilators, such as luminaria and dinoprostone (24, 25), as well as the effect of EPO plus misoprostol vs. misoprostol plus placebo in nulliparous women with post-term pregnancy, which has confirmed the efficacy of EPO on cervical ripening during labor (11). Nonetheless, as far as the researchers of this study investigated, none of the mentioned studies have compared EPO with misoprostol on cervical dilatation before gynecologic surgical procedures in order to be comparable to our results.

Another important aspect of the present study was that comparing the risk of complications and the results showed no difference between EPO and misoprostol groups in this regard. As the cervical status is different between pre- and post-menopausal women, some studies have suggested a higher risk of cervical laceration and higher need for further dilation compared to pre-menopausal women by the use of pre-operational misoprostol (26, 27), while some other studies have rejected such a difference (7). Therefore, we separated the results based on menopause status and the results showed that all of the variables were different in nulliparous non-menopause women, which confirmed that in nulliparous non-menopause women EPO had a greater efficacy and fewer complications, while in post-menopausal women and women without NVD, the complication rates were similar, like the whole study population. The study by Vahdat *et al.* reported no cervicovaginal complication among their study population in EPO or placebo group (15), while we observed 7 cases of cervical laceration in EPO group, which could be due to the small sample size of their study, as well as a lower dose and longer interval of administering EPO in their study (15). In addition, subgroup analysis in their study showed the efficacy of EPO in both non- and post-menopausal women (15), which in line with the results of the present study and confirms the applicability of EPO in both groups.

The main strength of the present study was that it compared the outcome of EPO and misoprostol between two groups with similar baseline characteristics in a blinded RCT. However, our study had two main limitations, including nonrandomized inclusion of patients and selection of participants from one center, which increased the chance of bias and the effect of confounders on the study results.

Conclusion

In conclusion, EPO is superior to misoprostol for cervical dilatation before gynecologic surgical procedures in both non- and post-menopausal women, while it additionally decreases the risk of complications in non-menopause women, which suggest EPO as a safe and efficient cervical dilator to be used before gynecologic surgeries.

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None

Conflict of Interest

The authors have no conflicts of interest relevant to this article.

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References

1. Gilstrap M, Sciscione A, editors. Induction of labor—Pharmacology methods. *Seminars in perinatology*; 2015: Elsevier.
2. Ramirez MM. Labor induction: a review of current methods. *Obstetrics and Gynecology Clinics*. 2011;38(2):215-25. [DOI:10.1016/j.ogc.2011.02.012] [PMID]
3. Sciscione AC. Methods of cervical ripening and labor induction: mechanical. *Clinical obstetrics and gynecology*. 2014;57(2):369-76. [DOI:10.1097/GRF.000000000000023] [PMID]
4. Bakker R, Pierce S, Myers D. The role of prostaglandins E1 and E2, dinoprostone, and misoprostol in cervical ripening and the induction of labor: a mechanistic approach. *Archives of gynecology and obstetrics*. 2017;296(2):167-79. [DOI:10.1007/s00404-017-4418-5] [PMID]
5. Chatsis V, Frey N. Misoprostol for Cervical Ripening and Induction of Labour: A Review of Clinical Effectiveness, Cost-Effectiveness and Guidelines. 2018.
6. Alfirevic Z, Keeney E, Dowswell T, Welton NJ, Medley N, Dias S, et al. Which method is best for the induction of labour?: A systematic review,

- network meta-analysis and cost-effectiveness analysis. *Health technology assessment*. 2016. [[DOI:10.3310/hta20650](https://doi.org/10.3310/hta20650)] [[PMID](#)] [[PMCID](#)]
7. Gkrozou F, Koliopoulos G, Vrekoussis T, Valasoulis G, Lavidis L, Navrozoglou I, et al. A systematic review and meta-analysis of randomized studies comparing misoprostol versus placebo for cervical ripening prior to hysteroscopy. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 2011;158(1):17-23. [[DOI:10.1016/j.ejogrb.2011.04.022](https://doi.org/10.1016/j.ejogrb.2011.04.022)] [[PMID](#)]
 8. Farzaneh F, Fatehi S, Sohrabi M-R, Alizadeh K. The effect of oral evening primrose oil on menopausal hot flashes: a randomized clinical trial. *Archives of gynecology and obstetrics*. 2013;288(5):1075-9. [[DOI:10.1007/s00404-013-2852-6](https://doi.org/10.1007/s00404-013-2852-6)] [[PMID](#)]
 9. Bamford JT, Ray S, Musekiwa A, van Gool C, Humphreys R, Ernst E. Oral evening primrose oil and borage oil for eczema. *Cochrane Database of Systematic Reviews*. 2013(4). [[DOI:10.1002/14651858.CD004416.pub2](https://doi.org/10.1002/14651858.CD004416.pub2)] [[PMID](#)]
 10. Nonette DN. The effectiveness of evening primrose oil gel capsule as a cervical ripening agent during labor induction as measured by bishop score on term singleton pregnant patients. *Philippine Journal of Obstetrics and Gynecology*. 2017;41(2):1-4.
 11. Bahmani S, Hesamy K, Shahgheibi S, Roshani D, Shahoei R. Comparison of the Effect of Vaginal Capsule of Evening Primrose Oil and Misoprostol on Cervical Ripening of Nulliparous Women with Post-term Pregnancy. *Journal of Pharmaceutical Research International*. 2019:1-9. [[DOI:10.9734/jpri/2019/v26i330140](https://doi.org/10.9734/jpri/2019/v26i330140)]
 12. Shahali S, Khatami F, Abbaspoor Z, Gheraghian B. The effect of vaginal evening primrose capsule on cervical ripening in nulliparous women with post-term pregnancy: A clinical trial. *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2018;21(8):30-8.
 13. Jahdi F, Kalati M, Kashanian M, Naseri M, Haghani H. Effect of oral evening primrose capsules on ripening of the cervix in nulliparous Iranian pregnant women (a randomized trial). *Acta Medica Mediterranea*. 2016;32(Specia):1273-9.
 14. Kalati M, Kashanian M, Jahdi F, Naseri M, Haghani H, Sheikhsari N. Evening primrose oil and labour, is it effective? A randomised clinical trial. *Journal of Obstetrics and Gynaecology*. 2018;38(4):488-92. [[DOI:10.1080/01443615.2017.1386165](https://doi.org/10.1080/01443615.2017.1386165)] [[PMID](#)]
 15. Vahdat M, Tahermanesh K, Kashi AM, Ashouri M, Dodaran MS, Kashanian M, et al. Evening primrose oil effect on the ease of cervical ripening and dilatation before operative hysteroscopy. *Thrita*. 2015;4(3). [[DOI:10.5812/thrita.29876](https://doi.org/10.5812/thrita.29876)]
 16. Aquino P, Fernandez H, Garcia M, Barrientos M, Apepe E, Pichay R. Determining the Ease of Cervical Dilatation in Patients Given Evening Primrose Oil (Eveprim®) Intravaginally before Hysteroscopy in Postmenopausal and Nulliparous, Premenopausal Women Ages 37-77 Years Old: A Pilot Study. *Journal of Minimally Invasive Gynecology*. 2011;18(6):S126-S7. [[DOI:10.1016/j.jmig.2011.08.518](https://doi.org/10.1016/j.jmig.2011.08.518)]
 17. Darwish A, Ahmad A, Mohammad A. Cervical priming prior to operative hysteroscopy: a randomized comparison of laminaria versus misoprostol. *Human reproduction*. 2004;19(10):2391-4. [[DOI:10.1093/humrep/deh397](https://doi.org/10.1093/humrep/deh397)] [[PMID](#)]
 18. Marian C. A randomized controlled trial of evening primrose oil for cervical priming prior to operative hysteroscopy. *Philippine Journal of Reproductive Endocrinology and Infertility*. 2009;6(2):35-40.
 19. Mahboubi M. Evening Primrose (*Oenothera biennis*) Oil in Management of Female Ailments. *Journal of menopausal medicine*. 2019;25(2):74-82. [[DOI:10.6118/jmm.18190](https://doi.org/10.6118/jmm.18190)] [[PMID](#)] [[PMCID](#)]
 20. Tanchoco M, Aguilar A. Cervical priming prior to operative hysteroscopy: a randomized controlled study comparing the efficacy of laminaria versus evening primrose oil (EPO). *Journal of minimally invasive gynecology*. 2015;22(6):S45. [[DOI:10.1016/j.jmig.2015.08.122](https://doi.org/10.1016/j.jmig.2015.08.122)] [[PMID](#)]
 21. Allen R, O'Brien BM. Uses of misoprostol in obstetrics and gynecology. *Reviews in obstetrics and gynecology*. 2009;2(3):159.
 22. Hua Y, Zhang W, Hu X, Yang A, Zhu X. The use of misoprostol for cervical priming prior to hysteroscopy: a systematic review and analysis. *Drug design, development and therapy*. 2016;10:2789. [[DOI:10.2147/DDDT.S111625](https://doi.org/10.2147/DDDT.S111625)] [[PMID](#)] [[PMCID](#)]
 23. Pierce S, Bakker R, Myers DA, Edwards RK. Clinical Insights for Cervical Ripening and Labor Induction Using Prostaglandins. *American Journal of Perinatology Reports*. 2018;8(04):e307-e14. [[DOI:10.1055/s-0038-1675351](https://doi.org/10.1055/s-0038-1675351)] [[PMID](#)] [[PMCID](#)]

24. Al-Fozan H, Firwana B, Al Kadri H, Hassan S, Tulandi T. Preoperative ripening of the cervix before operative hysteroscopy. *Cochrane Database of Systematic Reviews*. 2015(4). [[DOI:10.1002/14651858.CD005998.pub2](https://doi.org/10.1002/14651858.CD005998.pub2)] [[PMID](#)]
25. Harper M, Moutrey S, Clark NJ. Preoperative ripening of the cervix before operative hysteroscopy. *Journal of Perioperative Practice*. 2017.
26. Polyzos N, Zavos A, Valachis A, Dragamestianos C, Blockeel C, Stoop D, et al. Misoprostol prior to hysteroscopy in premenopausal and postmenopausal women. A systematic review and meta-analysis. *Human reproduction update*. 2012;18(4):393-404. [[DOI:10.1093/humupd/dms014](https://doi.org/10.1093/humupd/dms014)] [[PMID](#)]
27. Sordia-Hernández LH, Rosales-Tristan E, Vazquez-Mendez J, Merino M, Iglesias JL, Garza-Leal JG, et al. Effectiveness of misoprostol for office hysteroscopy without anesthesia in infertile patients. *Fertility and sterility*. 2011;95(2):759-61. [[DOI:10.1016/j.fertnstert.2010.07.1066](https://doi.org/10.1016/j.fertnstert.2010.07.1066)] [[PMID](#)].

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