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Original Article

The effect of vaginal evening primrose on the Bishop score of term nulliparous women

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ABSTRACT

Background & Aim: Desirable bishop score is necessary for having a successful delivery. Prostaglandins are effective on cervical ripening, and primrose contains precursors of these materials. Therefore, the present study was conducted to evaluate the effect of vaginal Evening primrose on the bishop score among term nulliparous women.
Methods & Materials: The present double-blind, randomized clinical trial was conducted on 86 nulliparous women who referred to the comprehensive health service centers of Rafsanjan from November 2017 to May 2018. The samples were selected through convenient sampling method and allocated into two intervention and placebo groups with simple random assignment. The intervention group used a daily dose of 1000 mg vaginal capsules of Evening primrose from the 38th week of pregnancy until delivery, and the placebo group received a similar placebo with a similar administration method. The Information about the women's bishop score was gathered from the participants' medical files in the hospital and then was analyzed using SPSS software version 16 and Kolmogorov-Smirnov test, Chi-square test, and independent t-test.
Results: The total mean and standard deviation of the bishop score in the intervention and placebo groups were respectively 7.83 ± 2.09 and 4.46 ± 2.39, and the simplified bishop score in the intervention and the control groups was respectively 5.93 ± 2.42 and 2.81 ± 2.02. The difference between the two groups considering both of the bishop scores was statistically significant (p = 0.001).
Conclusion: Vaginal Evening primrose is useful to ripen the cervix of term nulliparous women, and so, it could be administered for this purpose.

Introduction

The prerequisite for successful vaginal delivery is the comprehensive cervical reconstruction which is called cervical ripening and is followed by its softness and dilation. It occurs through a gradual process during labor and would fasten the occurrence of delivery (1). Cervical ripening is a crucial element for the successful induction of labor that would facilitate the narrowing, softening, and widening of the cervix (2). The Bishop's score would usually determine the ripening.

Determining the Bishop score which contains four characteristics of the cervix (dilation, effacement, position and consistency of the cervix) and fetal presentation part station, would be conducted efficiently (3), and is the most commonly used scoring system that has been used to predict the success of induced labor, despite all the modern introduced methods (4-6). This method is still the most affordable and accurate method for predicting the possibility of vaginal delivery following the induction of labor, even in nulliparous women (7).

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To help the ripening of the cervix, medical and mechanical methods are being used which would take hours especially in nulliparous women and would increase the workload of the crowded labor departments and would also increase costs (8). Also, stimulation of the cervical ripening through medicinal and surgical methods has undesirable consequences including hemorrhage during and after delivery, more prolonged labor, fetal distress and injuries, uterine rupture and inertia, chorioamnionitis, and increased mortality rate (9). So it is more desirable than this matter would be addressed safe and sound during outpatient care (10).

Although delivery is increasingly becoming a medicinal issue, some women are looking for complementary and alternative methods to achieve a natural experiment in their delivery (11, 12). In this regard, using herbal medicine, especially during prenatal care and delivery is consistent in world annals (13).

One of the herbal medicines that, despite the beliefs and extensive recommendations for its consumption, has been evaluated limitedly regarding its effect on cervical ripening and there are limited and controversial opinions about it, is Evening primrose (13-16)The ripen seeds of this plant approximately contain 70% linoleic acid, and 7-10% gamma-linoleic acid (17). Gamma linoleic acid has an essential role as the precursor of prostaglandin E1 (16, 18), and this type of prostaglandin is one of the joint capsules for the preparation of cervix (19).

The effect of oral consumption of Evening primrose on cervical ripening and the process of labor has been evaluated in a limited number of studies, and contradictory results have been achieved (16, 20). The effect of its vaginal use on cervical ripening before some of the gynecological procedures has been evaluated, and beneficial results have been observed on the softening and preparation of the cervix before the intended procedure (14, 21). Also, the results of a study revealed positive effects of vaginal use of Evening primrose simultaneously as the induction of vaginal delivery on cervical ripening in primiparous women with lingered delivery (22). Considering that the effect of vaginal use of Evening primrose during pregnancy on the Bishop score of term nulliparous women has not yet been evaluated and no study was found with this subject, and also considering the importance of ripening and preparation of the cervix for a successful vaginal delivery, the present study was conducted to evaluate the effect of vaginal Evening primrose capsule on the Bishop score of term nulliparous women.

Methods

The present study was a double-blind, randomized clinical trial that was registered in the Iranian Registry of Clinical Trials under the No. IRCT20160308026971N4. The study population for the present study contained all the nulliparous women who referred to the comprehensive health services centers of Rafsanjan from November 2017 to May 2018. The sample size was calculated as 43 participants per group based on a similar study (23) and considering an α of 0.05, β of 10%, the standard deviation of 3.63 and a score difference of 2.5 between both groups using the mean difference formula.

Samples were selected through the convenient method and eligible pregnant women with a gestational age of 36 to 37 weeks were found through the HIS system and contacted through phone calls. After explaining the goals of the study, if they were willing to participate, an appointment was set at the place of the health center. After taking written informed consent and completing the demographic characteristics form, participants were assigned into two groups of intervention and placebo using simple randomization method and the table of random numbers even numbers for the intervention group and odd numbers for the placebo group).

The inclusion criteria were willingness to participate in the study and have a vaginal delivery, selecting Nik Nafs maternity

hospital of Rafsanjan for their delivery, being 18 to 35 years old, being taller than 150 cm, having a gestational age of 38 week according to the ultrasound of the first trimester or a reliable IMP, having a singleton fetus according to the results of the last ultrasound, live and healthy embryo with modified standard biophysical profile, being nulliparous, having an intact amniotic sac, having no contractions, not having any known chronic disease and uterine surgery, lack of substance abuse, not having any contraindication for use Evening primrose including underlying diseases along with hemorrhagic disorders, consuming anticoagulants, not having a history of psychological disorder consuming phenothiazine, and not having epilepsy.

The exclusion criteria included, not using the vaginal evening primrose capsule for two consecutive times, having allergy to the capsule, having the need for urgent medical intervention due to maternal or fetal reasons, occurrence of pregnancy complications such as polyhydramnios, oligohydramnios, preeclampsia, eclampsia, vaginal hemorrhage, placental abruption, intercourse, enema, consuming laxative capsules and other herbal capsules or any other methods for facilitating vaginal delivery.

1000 mg soft capsules of Evening primrose with the commercial name of EPO was given to the intervention group, and similar 1000 mg soft capsules containing edible paraffin was given to the control group. Both capsules were made by the Barij Essence Company and were received without names and labeled as A and B from the company and until the time of the data analysis, the capsules of the A and B codes were not known; therefore the study was conducted as double-blind. The method of using vaginal capsules of Evening primrose and placebo was trained to the participants, and they were recommended to use one of them as vaginal capsule every night from the 38th week of pregnancy until the time of delivery and remain laid down at least for 2 hours after inserting the capsule, if possible. Also, to ensure the usage of the capsule, daily recording form was given to the participants so that they sign the form every time they use the capsule. The researcher called the participants every 48-72 hours to answer they are probable questions, and make sure the regular usage of the capsule and the placebo and completion of the recording form.

The data collection tool was a questionnaire including demographic and fertility characteristics, information about the Bishop score and some secondary outcomes like duration of the latent, active and second stage of labor, induction and augmentation of labor, first and fifth Apgar score, type of delivery and hemorrhage during the first 2 hours after delivery. The Content validity of the questionnaire was approved by gathering the opinion of 10 expert academic members in this field and applying their opinions.

Information about the items of the participants' bishop score and secondary outcomes, was extracted from their medical files in the hospital after delivery. Bishop score was calculated in two ways of using five criteria and simplified bishop using three criteria of dilation, effacement, and head's position by doubling the dilation score (24). The Bishop score of the vaginal examination recorded at the time of admission of the pregnant woman for delivery was recorded in the case file. The present study was derived from a Master's thesis under the No. IRCT20160308026971N4 and registered in the Iranian registry for clinical trials and under the ethics code of IR.RUMS.REC1396.89 that was conducted with the financial help of the Rafsanjan University of Medical Sciences.

Finally, the collected data was analyzed with SPSS 16 using Kolmogorov-Smirnov, chi-square, and independent t-tests.

Results

During the 30-week study, 123 pregnant women were selected for the study. From whom, 17 did not qualify for inclusion in the study, and 20 did not consent to participate in the project. So, 86 (43 people in each group) were enrolled, and the study ended with the same number (Figure 1).

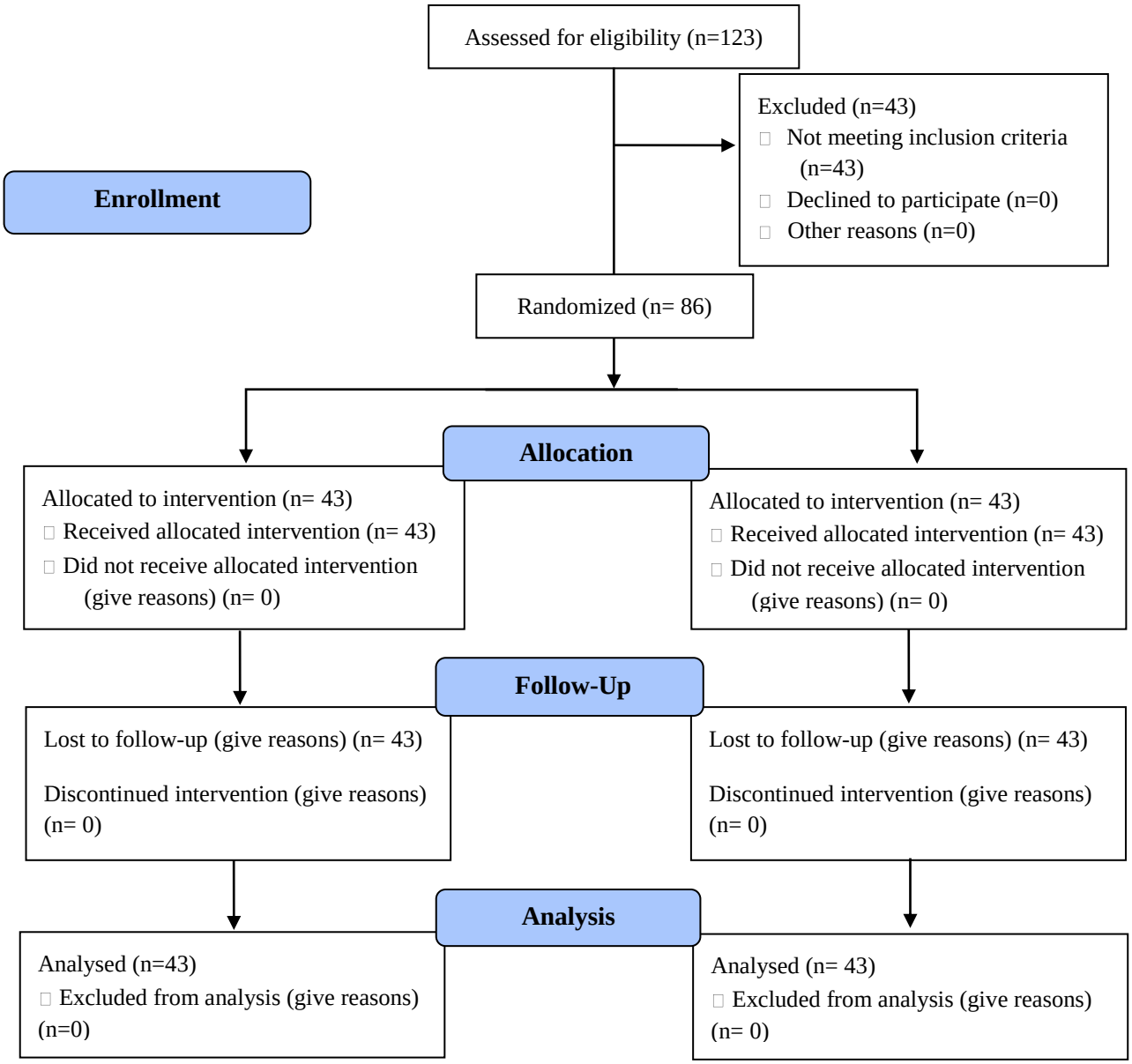

Figure 1. Flow diagram of the study

The Kolmogorov-Smirnov test showed that the variables studied such as age, body mass index (BMI), Number of used capsules, and Gestational age had a normal distribution. Results showed no significant difference between the intervention and the placebo group regarding their age, body mass index, gestational age, education, employment, and the number of used capsules (Table 1).

The significant difference was observed between the intervention and the placebo group regarding the total Bishop score and the simplified Bishop score at the time of referral for delivery (p=0.001); participants of the intervention had a more prepared and desirable cervix for delivery (Table 2).

According to the results of the present study, all the five criteria of Bishop including descent (p=0.005), dilation, effacement, position and consistency of the cervix (p=0.001), was significantly different in the intervention group in comparison with the control group.

At the time of referral, in the intervention, the highest frequencies belonged to the dilation of 3-4 cm (67.4%) and effacement of 60-70% (41.86%) and in the control group, the highest frequencies belonged to the dilation of 1-2 cm (76.7%) and effacement of 0-30% (74.42%). In both groups, most of the

patients referred with a station of -3; however, in the intervention group, the frequency of stations -1 and -2 was higher than the placebo group, and in the control group, the frequency of the station -3 was higher than the intervention group. In both of the intervention and the control groups, the most frequent position at the time of referral for delivery was anterior position; none of the participants in the intervention group had a posterior or medial cervical position at the time of referral for delivery.

Table 1. Comparison of the demographic characteristics between the intervention and the control groups

Variable \ Group		Intervention (Evening Primrose)	Control (placebo)	P value*
		Mean ± SD	Mean ± SD	
Mother's age		24.40 ± 3.62	24.47 ± 3.72	0.93*
Body mass index (BMI)		24.05 ± 3.17	24.29 ± 3.26	0.73*
Number of used capsules		10.42 ± 3.98	10.05 ± 5.21	0.71*
Gestational age according to the ultrasound of the first trimester		278.40 ± 5.05	278.31 ± 6.43	0.94
Educational level	**Subgroup**	**N (%)**	**N (%)**	
	Under diploma	2 (4.7)	4 (9.3)	0.41**
	Diploma	20 (46.5)	26 (60.5)	
	Associate's degree	4 (9.3)	4 (9.3)	
	Bachelor's degree	13 (30.2)	7 (16.3)	
	Master's degree	4 (9.3)	2 (4.7)	
	Total	43 (100)	43 (100)	
Employment status	Housewife	39 (90.7)	42 (97.7)	0.16**
	Employed	4 (9.3)	1 (2.3)	
	Total	43 (100)	43 (100)	

*Independent two-sample t-test

** Chi-square test

Table 2. Comparison of the total Bishop score and the simplified Bishop score between the intervention and the control groups at the time of referral for delivery

Bishop \ Group	Intervention (Evening primrose)	Control (Placebo)	P value*
	Mean ± SD	Mean ± SD	
Total Bishop score	7.83 ± 2.09	4.46 ± 2.39	0.001
Simplified Bishop score	5.93 ± 2.42	2.81 ± 2.02	0.001

* Independent two-sample t-test

In the control group, 9.3% of the participants referred to a posterior or medial cervical position. Nulliparous women in the intervention group had better cervix consistency in comparison with the control group; although in both groups, soft consistency had the highest frequency, the difference between both groups in this regard was statistically significant (91.3% vs. 51.2%). Referring to hard cervical consistency was more significant in the placebo group (30.2% vs. 4.7%) (Table 3).

According to the results considering the delivery outcomes, the duration of the latent phase of delivery, the type of delivery, and induction of labor had a significant difference between the two groups ($p<0.05$); in a way that the duration of the latent phase of delivery was shorter in the intervention group than the control group, the ratio of vaginal

delivery to caesarian section was higher in the intervention group than the placebo group and the cases of induction with oxytocin was less in the intervention group than the control group. Considering the active phase of labor, duration of the second stage of labor, the amount of used oxytocin after delivery, Apgar score at the 1st and 5th minutes after delivery, augmentation and hemorrhage during the first 2 hours after delivery, no significant difference was observed between the two groups (p>0.05) (Table 4 and 5).

Table 3. Frequency distribution and percentage of the dilation, effacement, descent, position and cervical consistency in the intervention and the control groups at the time of referral for delivery

Variable / Group		Intervention (Evening primrose) N (%)	Control (Placebo) N (%)	P value*
Dilation	Closed (0)	0 (0)	3 (7)	0.001
	1-2 (1)	7 (16.3)	33 (76.7)	
	3-4 (2)	29 (67.4)	5 (11.6)	
	5 or more (3)	7 (16.3)	2 (4.6)	
	Total	43 (100)	43 (100)	
Effacement	0-30 (0)	7 (16.3)	32 (74.42)	0.001
	40-50 (1)	17 (39.53)	7 (16.3)	
	60-70 (2)	18 (41.86)	4 (9.3)	
	80 or more (3)	1 (2.32)	0 (0.0)	
	Total	43 (100)	43 (100)	
Descent of the fetus	-3	25 (58.1)	38 (88.4)	0.005
	-2	9 (20.9)	3 (7.0)	
	-1	8 (18.6)	0 (0.0)	
	0	1 (2.3)	1 (2.3)	
	1	0 (0.0)	1 (2.3)	
	Total	43 (100)	43 (100)	
Cervical position	Posterior	0 (0)	4 (9.3)	0.001
	Median	0 (0)	12 (27.9)	
	Anterior	43 (100)	27 (62.8)	
	Total	43 (100)	43 (100)	
Cervical consistency	Soft	41 (95.3)	22 (51.2)	0.001
	Medium	0 (0)	8 (18.6)	
	Hard	2 (4.7)	13 (30.2)	
	Total	43 (100)	43 (100)	

*Chi-square test

Table 4. Comparing the quantitative outcomes of delivery of nulliparous women between the intervention and the control groups

Variable / Group	Intervention (Evening primrose) Mean ± SD	Control (Placebo) Mean ± SD	P value*
Duration of the latent phase	283.55 ± 297.41	525.95 ± 306.95	0.006
Duration of the active phase	249.55 ± 131.27	226.52 ± 132.53	0.52
Duration of the second phase	54.70 ± 36.11	64.76 ± 43.63	0.36
The amount of used oxytocin after deliver	27.44 ± 10.93	27.98 ± 7.57	0.79
1st minute Apgar score	8.91 ± 0.36	9 ± 0	0.09
5th minute Apgar score	9.95 ± 0.21	10 ± 0	0.15

*Independent two-sample t-test

Table 5. Comparing the qualitative outcomes of delivery of nulliparous women between the intervention and the control groups

Type of delivery / Group		Intervention (Evening primrose)	Control (Placebo)	P value*
		N (%)	N (%)	
Vaginal delivery		29 (67.4)	22 (51.2)	0.02
Caesarian section		9 (20.9)	20 (46.5)	
Total		43 (100)	43 (100)	
Induction of labor	Yes	12 (28.6)	21 (61.8)	0.004
	No	30 (71.4)	13 (38.2)	
	Total	42 (100)	34 (100)	
Augmentation	Yes	19 (47.5)	12 (40)	0.53
	No	21 (52.5)	18 (60)	
	Total	40 (100)	30 (100)	
Hemorrhage during the first 2 hours after delivery	Normal	40 (93)	38 (90.5)	0.66
	Abnormal	3 (7)	4 (9.5)	
	Total	43 (100)	42 (100)	

*Chi-square test

Discussion

Results of the present study revealed that vaginal use of Evening primrose capsules with a daily the dose of 1000 mg from the 38th week of pregnancy until the time of delivery could be useful in the cervical ripening in nulliparous women and improving Bishop Score.

In the study of Shah Ali et al. (2018) the effect of vaginal use of Evening primrose oil on cervical ripening in primiparous women with lingered delivery was evaluated, and results showed a significant difference between the intervention and the placebo group regarding cervical ripening. In the aforementioned study, women with lingered delivery, simultaneous to induction of delivering with oxytocin, received a single dose of 1000 mg of vaginal Evening primrose (22); but in the present study, women with term pregnancy received 1000 mg of vaginal Evening primrose from the beginning of the 38th week of pregnancy until the time of labor.

Ty-Torredes et al. in 2006 evaluated the effect of one Evening primrose oral capsule three times and cervical length of term pregnant women. Results showed that the biophysical profile and stress-free test before and after the intervention in both groups were normal. The effect of Evening primrose in the Ty-Torredes' study on term nulliparous women and from the 39th week of pregnancy was higher (25).

In the study of Kalati et al. in 2018 which was titled "the effect of consuming oral capsules of Evening primrose on cervical ripening and pregnancy outcomes," no significant difference was observed between both groups regarding their Bishop score (16); which was not similar to the results of the present study. These different results might be due to the differences in the prescribed method of the consumption of the capsule and the duration of its consumption. In the study of Kalati, the capsules were consumed from the 40th week of pregnancy until the 40th week and sixth day; but in the present study, the capsule was used from the 38th week of pregnancy until the time of delivery.

The effect of vaginal primrose on Bishop Score and cervical ripening in nulliparous women has not been studied so far. Few studies have evaluated the effect of vaginal Evening primrose on the ripening of the cervix before gynecological procedures.

Aquino et al. in 2011 reported the effect of two 1000 mg vaginal capsules of Evening primrose that was used 4 to 6 hours before hysterectomy on cervical dilation with any complications(26).

In the study of Girile et al. in 2014 that was aimed to evaluate the effect of Evening primrose on cervical ripening before gynecological procedures such as hysterectomy and curettage, results showed that usage of 4 vaginal capsules of Evening primrose 6 hours before the procedure

would improve the dilation and cervical consistency (21).

In a similar study, results of Vahdat et al in 2015 that was aimed to evaluate the effect of using Evening primrose oil on ripening and dilation before hysterectomy showed that prescription of two vaginal tube gels, which contained a total of 1000 mg of Evening primrose oil, 6 to 8 hours before hysterectomy could significantly lead to cervical ripening and dilation (14). In the studies of Aquino, Girile, and Vahdat, although Evening primrose was used a couple of hours before gynecological procedures such as hysterectomy and curettage, it still was effective on cervical ripening; so it seems that using higher vaginal doses of the capsule could help reach cervical ripening in a shorter time. Although this capsule is an herbal product, still the safety of higher doses during pregnancy should be evaluated.

In the present study, vaginal use of Evening primrose significantly reduced the duration of the latent phase of delivery in the intervention group. Since the duration of the latent phase of delivery is directly related to cervix ripening, it can be assumed that the reduction in the duration of the latent phase in the present study has also been related to cervix ripening. In a way that, in some studies that were conducted few hours after gynecologic procedures including hysterectomy and curettage on non-pregnant women, vaginal Evening primrose with high dosage was prescribed, and its effectiveness and improvement of cervix ripening were observed (27-29). In the study of Nonette et al. (2017) also, the effect of vaginal Evening primrose on the Bishop score simultaneously as the induction of labor was observed (30).

Ineffectiveness of Evening primrose on other stages of labor in the present study might be due to the fact that the effect of each capsule depends on its half-life and considering that in the present study using Evening primrose was stopped as labor started and it would not continue during labor, it showed no effect on the stages of labor.

Limitation

Researchers found no study about the effect of vaginal Evening primrose during the last weeks of pregnancy on the Bishop score of term nulliparous women in their searches and so, the present study seems to be novel in this regard. Among the limitations of this study can be noted that since the time and place of referring to the labor room could not be predicted in the present study, it was not possible that one individual would perform all the vaginal examinations.

According to the results of the present study, vaginal capsules of Evening primrose could be an effective, safe, affordable, and without the necessity of being hospitalized method to achieve cervical ripening in term nulliparous women. More studies in this field are required.

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Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

References

1. Sennström MB, Ekman G, Westergren-Thorsson G, Malmström A, Byström B, Endrésen U, Mlambo N, Norman M, Ståbi B, Brauner A. Human cervical ripening, an inflammatory process mediated by cytokines. Molecular human reproduction. 2000 Apr 1;6(4):375-81.

2. American College of Obstetricians and Gynecologists. ACOG practice bulletin no. 107: induction of labor. Obstet Gynecol. 2009;114:386-97.

3. Hadi H. Cervical ripening and labor induction: clinical guidelines. Clinical Obstetrics and Gynecology. 2000 Sep 1;43(3):524-36.

4. Baacke KA, Edwards RK. Preinduction cervical assessment. Clinical obstetrics and gynecology. 2006 Sep 1;49(3):564-72.
5. Hofmeyr GJ. Induction of labour with an unfavourable cervix. Best Practice & Research Clinical Obstetrics & Gynaecology. 2003 Oct 1;17(5):777-94.
6. Crane JM. Factors predicting labor induction success: a critical analysis. Clinical obstetrics and gynecology. 2006 Sep 1;49(3):573-84.
7. Teixeira C, Lunet N, Rodrigues T, Barros H. The Bishop Score as a determinant of labour induction success: a systematic review and meta-analysis. Archives of gynecology and obstetrics. 2012 Sep 1;286(3):739-53.
8. Sciscione AC, Muench M, Pollock M, Jenkins TM, Tildon-Burton J, Colmorgen GH. Transcervical Foley catheter for preinduction cervical ripening in an outpatient versus inpatient setting. Obstetrics & Gynecology. 2001 Nov 1;98(5):751-6.
9. Mohammadinia N, Rezaei MA, Loripour M, Heydari N. The effect of consumption of Sisymbrium-seeds at the end of pregnancy on the rate of cesarean delivery and apgar score. The Iranian Journal of Obstetrics, Gynecology and Infertility. 2012;15(27):8-13.
10. Grobman WA. Is it time for outpatient cervical ripening with prostaglandins?. BJOG: An International Journal of Obstetrics & Gynaecology. 2015 Jan;122(1):105.
11. Skouteris H, Wertheim EH, Rallis S, Paxton SJ, Kelly L, Milgrom J. Use of complementary and alternative medicines by a sample of Australian women during pregnancy. Australian and New Zealand Journal of Obstetrics and Gynaecology. 2008 Aug;48(4):384-90.
12. Dowswell T, Kelly AJ, Livio S, Norman JE, Alfirevic Z. Different methods for the induction of labour in outpatient settings. The Cochrane database of systematic reviews. 2010(8):CD007701.
13. Hall HG, McKenna LG, Griffiths DL. Complementary and alternative medicine for induction of labour. Women and Birth. 2012;25(3):142-8.
14. 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).
15. Dugoua J-J. Herbal medicines and pregnancy. J Popul Ther Clin Pharmacol. 2010;17(3):e370-e8.
16. Kalati M, Kashanian M, Jahdi F, Naseri M, Haghani H, Sheikhansari N. Evening primrose oil and labour, is it effective? A randomised clinical trial. Journal of Obstetrics and Gynaecology. 2018:1-5.
17. Birch A, Fenner G, Watkins R, Boyd L. Antioxidant properties of evening primrose seed extracts. Journal of agricultural and food chemistry. 2001;49(9):4502-7.
18. Rezapour-Firouzi S, Arefhosseini SR, Mehdi F, Mehrangiz EM, Baradaran B, Sadeghihokmabad E, Mostafaei S, Fazljou SM, Torbati MA, Sanaie S, Zamani F. Immunomodulatory and therapeutic effects of Hot-nature diet and co-supplemented hemp seed, evening primrose oils intervention in multiple sclerosis patients. Complementary therapies in medicine. 2013 ;21(5):473-80.
19. Wing DA, Sheibani L. Pharmacotherapy options for labor induction. Expert opinion on pharmacotherapy. 2015;16(11):1657-68.
20. Girlie VB. The efficacy of evening primrose oil as a cervical ripening agent for gynecologic procedures: A single-blinded, randomized controlled trial. Philippine Journal of Obstetrics and Gynecology. 2015 Jan;39(1):25-8.
21. 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.
22. Saberi F, Abedzadeh M, Saadat Z. The use of castor oil on cervical ripening in pregnancies. Journal of Mazandaran University of Medical Sciences. 2008;18(63):11-9.
23. Ivars J, Garabedian C, Devos P, Therby D, Carlier S, Deruelle P, Subtil D. Simplified Bishop score including parity predicts successful induction of labor. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2016; 203:309-14.
24. Ty-Torredes KA. The effect of oral evening primrose oil on bishop score and cervical length among term gravidas. American Journal of Obstetrics & Gynecology. 2006;195(6):S30.
25. Aquino, P.A., Fernandez, H.D., Garcia, M.I., Barrientos, M.A., Apepe, E.T.B. and

Pichay, R.L., 2011. Determining the Ease of Cervical Dilation 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*, *18*(6), pp.S126-S127.

26. Nordeng H, Havnen GC. Impact of socio-demographic factors, knowledge and attitude on the use of herbal drugs in pregnancy. Acta obstetricia et gynecologica Scandinavica. 2005;84(1):26-33.

27. Hosseini SH, Rajabzadeh R, Nosrati H, Naseri F, Toroski M, Mohaddes Hakkak H, et al. Prevalence of medicinal herbs consumption in pregnant women referring to Bojnurd health care centers. The Iranian Journal of Obstetrics, Gynecology and Infertility. 2017;20(9):33-40.

28. Momeni H, Salehi A, Seraji A. The comparison of Vitex agnus castus and evening primrose oil on women's depression: a clinical trial. Yafte. 2013;15(2):67-76.

29. 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.