Effect of *Dill* (*Anethum graveolens* Linn.) seed on uterus contractions pattern in active phase of labor

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Dill is herbaceous and aromatic herb used in order to convenient and shorter labor in Iran. The objective of this study was to evaluate the effect of Dill seed on uterus contractions in active phase of labor. In this historical cohort study, 40 women used *Dill* seed infusion in the case group and 60 women used nothing in the control group. Interpretable electronic fetal monitoring was obtained for half an hour at the beginning of the active phase. The Fall: Rise ratio was calculated by measuring the duration of time for a contraction to return to its baseline from its peak (fall) divided to the duration of its rise time to its peak (rise). The number of contractions in the case group was significantly more than the control group. The ratio of contraction’s fall time to its rise time in the case group was shorter than the control group. The study showed that *Dill* seed shortens duration of the first stage of labor. Since there is not enough information about correct amount and time for consuming this herb, more complete studies are needed.

**Keywords:** *Dill* seed; Pattern of uterus contractions; Active phase of labor

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Delivery is one of the most natural events in each woman’s life. It is considered a special period physically and psychologically which is followed by severe physical activity, stress, and pain with some potential hidden risks.¹² Dystocia is related to disorders in uterus contractions, birth canal, and fetus; its most common cause is ineffective uterus contractions.³⁵ In the evaluation of uterus contraction patterns, some studies have shown that return duration of a contraction to its baseline from its peak (fall) in relation to duration of rise time to peak (rise) in a dystocia is longer than normal vaginal deliveries.⁶⁷ Non-effective uterus contractions are related to some physical and psychological factors including lack of energy supply, dehydration, ketoacidosis, and fatigue.¹

Nowadays, oxytocin is used as 10 unit infusion for induction and augmentation of uterus contractions.⁴⁸ Also, prostaglandins directly affect on myometrium and induction of uterus contractions.⁹¹² Misoprostol and oxytocin are effective drugs, but each has its side effects.¹³ For example, side effects of oxytocin which is used as the first line of treatment include hypertension, water intoxication, bradycardia, headache, nausea, vomiting, anaphylactic reactions, cardiovascular complications and rupture of uterus.⁴¹⁴¹⁵ Industrial drugs have undesirable side effects despite effectiveness, therefore in recent years, using herbal medicine has widely increased.¹⁶ Many years ago, consumption of herbal medicine was common in Iran and other countries. These herbs were used by many women during pregnancy for different reasons. Most women believe that *dill* seed infusion (some dry herb is poured in boiling water and is consumed after a few minutes) at the beginning of labor causes augmentation of uterine contraction and quickening of labor. Traditional medical books have
reported that if a woman wants to have a convenient and shorter labor, she should drink dill seed infusion\(^{16,17}\).

Dill has been used in traditional herbal medicine for more than 2000 years. As traditional medicine, Dill seeds have been used in relieving digestive problems such as stomachache. It is also increase the milk in nursing mothers and to help prevent colic in the babies\(^{18}\). In addition to Dill are used to reduce blood cholesterol and lipid levels, menstrual bleeding and dysmenorrhea\(^{10,20,21,22}\).

*Dill* is a herbaceous and aromatic herb and its seed’s chemical combination includes tanin, a resin material and a volatile oil essence formed of limonene, keton, carvon, and an oily material. Its leaves have phalanderen, and its essence has anethole. It seems that analgesic and anti-inflammatory characteristics of dill seed may be due to its carvon and limonene. Tanins are usually from polyphenels which have contractive characteristics\(^{1,6,19,23}\).

Lis-balchin *et al* (1997) reported that a series of herbs such as *Dill* seed, angelica, fennel, and nutmeg in laboratory have contractive effects on myometer\(^{25}\). Moreover, dill seed plays an important role in releasing oxytocin which is an effective hormone in uterus contractions\(^{26}\).

Mahdavian *et al* (2001) reported that oral consumption of 6-7 gm of *dill* seed extract after delivery decreases postpartum hemorrhage due to its contractive characteristic compared to oxytocin\(^{16}\).

Results of a study conducted on Juniperi Fructus showed that this herb has contractive effect on uterine myometrium and this effect is due to limonene presented in this herb\(^{26}\).

A study performed in 2007 showed that anethole and estragon cause contractions which are due to their increased calcium level\(^{27}\). Both limonene and anethole have same combination as *dill* herb.

Despite traditional use of *dill* seed in the beginning of labor and women’s belief about its effect on feasibility of labor process and considering the results of laboratory studies based on contractive effect of *dill* seed on myometrium, we aimed to evaluate the efficacy of *Dill* seed on uterus contractions in progress of labor.

**Materials and methods**

*Dill* (Anethum graveolens) originated in the Mediterranean and the South of Russia. Dill grows to 40-100 cm. It is used its fruit and leaves. The flowers are white to yellow. The seeds are 4-5 mm (0.16-0.20 in) long and 1 mm thick. Dill is a source of protein, carbohydrate, phosphorus, iron, magnesium, sodium and potassium. It also contains a small amount of niacin, riboflavin and zinc. In this study, the plant was collected from an area around Tabas (East of Iran).

This historical cohort study was performed in the Maternity part of Omolbanin Hospital between May 2009 and August 2010 under an institutional review board approved protocol. Conditions of the study were completely explained for women who met the inclusion criteria. If they consented, a questionnaire including demographic and obstetrics characteristics was completed for each woman. Inclusion criteria was being 18-35 yrs, primiparous, having single fetus with cephalic presentation, gestational age 37-42 weeks, having no medical diseases, having no history of hospitalization due to psychological diseases, having no addiction to cigarette, having no complications during pregnancy such as hypertension, and BMI< 26. The women who had used *dill* seed infusion (1 tablespoon whole dill seed seeped in a half or whole cup boiling water for 3-4 min) before going to the hospital at the beginning of uterus contractions were placed in the case group (n = 40), and those who had not used any herbal drugs were placed at the control group (n = 60). At the beginning of active phase (dilatation 3-4 cm) while in a supine position during monitoring (if that position was not tolerated by the patient she was set to lateral position), a sensor was applied to the abdomen. The sensor was placed between the umbilicus and fundus of uterine a little to right side and was fasten by a belt to record uterus contractions. In this study, fetal monitor FC1400 was used and tocodynamometer recordings were obtained for 30 minutes by a researcher at the beginning of the active phase. The recordings were coded and were evaluated by both researchers separately and double blind. The F:R ratio was calculated by measuring the duration of time for a contraction to return to its baseline from its peak (fall) divided by the duration of its rise time to its peak (rise). Also, the F:R ratio was calculated for each woman and then was compared between the two groups.

After monitoring, if spontaneous rupture of membrane had not occurred and the fetal head was fixed in mother’s pelvis, amniotomy was performed. The mother was controlled and management of labor progress was performed by the form of recording
labor characteristics including duration of labor processes, amount of oxytocin consumption, time of performing amniotomy, consumption rate of liquid and analgesics and the form of recording neonate characteristics including sex, weight, height, head circumference which was completed. Data was analyzed by SPSS version 16. T test was used for comparing means between two groups and Chi-square test for comparing ratios.

**Results**

Mean age was 23.3 ± 3.5 yrs in the case group and 24.1 ± 4.2 yrs in the control group; p = 0.135 shows that there was no significant difference between two groups in terms of mean of age. Also, there was no significant difference between two groups regarding education level, job, husband’s education, location, and the economic status (p > 0.05). 8.4% of the case group and 9% of the control group had experienced unwanted pregnancy; there was no significant difference between two groups regarding this matter (p = 0.6). Moreover, two groups were not different in terms of performing intervention during the first stage of labor such as serum therapy, amniotomy (63.3% of the case group, and 50% of the control group, p = 0.16), and consumption of analgesics (Table 1). Administration of oxytocin as 10 units in 1000 ml was performed for 21% of the case group and 27.7% of the control group; there was no significant difference between two groups (p = 0.331).

Evaluation of *Dill* seed effect on the pattern of uterus contractions shows that the number of contractions was different between two groups (p = 0.047). The F:R ratio in women who used herbal drugs was 1.2 ± 0.27 and in those who had not was 1.42 ± 0.35; a statistically significant difference was observed (p = 0.021) (Table 2).

Evaluation of *Dill* seed effect on the progress of delivery process shows that mean duration of the first stage of labor was 4.8 ± 2.6 hrs in the case group, and 6.5 ± 3.4 hrs in the control group; a significant difference was observed between two groups (p = 0.031). But mean duration of the second and the third stages of labor were 33.5 ± 19 minutes and 10.3 ± 3.7 minutes in case group and 41.8 ± 17.8 minutes and 11 ± 5.9 minutes in control group, respectively; there was no significant difference between two groups (Table 3).

Two groups were not different in terms of neonate’s sex, weight, height, and head circumference.

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<th>Table 1—Demographic characteristics of participants</th>
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<td>Case group</td>
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<td>N=40</td>
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<td>Mean age (years) ± SD</td>
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<td>Mean height (cm) ± SD</td>
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<th>Table 2—Comparison of uterus contraction in case and control groups</th>
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<td>Case group</td>
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<td>N=40</td>
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<td>Frequency of contraction (Mean ± SD)</td>
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<td>Rise (s*) (Mean ± SD)</td>
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<td>Fall (s*) (Mean ± SD)</td>
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<td>F/R** (Mean ± SD)</td>
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*second  
**Fall:rise ratio

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<th>Table 3—Comparison of duration of stages of labor in case and control groups</th>
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<td>Case group</td>
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<td>N=40</td>
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<td>Mean First stage of labor (h) ± SD</td>
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<td>Mean Second stage of labor (min) ± SD</td>
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<td>Mean Third stage of labor (min) ± SD</td>
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**Discussion**

Correct use of synthetic and herbal drugs during pregnancy and delivery plays an important role in medical politics of the society. Using herbal drugs has been common in Iran from old time and the family elders suggest them to young persons in special conditions. Sereshti et al (2006) reported that 51.9%
of pregnant women in Iran consume herbal drugs and most of the consumption in third trimester is related to the last month (23.3%) due to induction of labor\textsuperscript{17}. Nordeng and Havenen (2005) reported that consumption rate of herbal drugs in pregnant women was 36%\textsuperscript{28}, this rate was 7% in America that was reported by Hepner \textit{et al}\textsuperscript{29}. The cause of difference in the rate of herbal drug consumption in this study and other countries may be due to differences in social, economical, and cultural status of our country and also feasible accessibility to these drugs.

In this study, the F:R ratio was lower in the case group which used \textit{Dill} seed than the control group which did not use any herbs; it means that return duration of a contraction from fall time to rise time was shorter in the control group. Driggers \textit{et al}. in 2002 stated that uterus contractions show special patterns in cephalo-pelvic disproportion. They also stated that fall time in relation to rise time in dystocia which are stopped due to cephalo-pelvic disproportion is longer than normal vaginal deliveries. They calculated new F:R ratio and found that in cases of cephalo-pelvic disproportion, this ratio is longer as compared to normal vaginal delivery\textsuperscript{7}. Althanus \textit{et al}. in 2006 found that mean of F:R was 1.77 in cesarean group and 1.55 in vaginal delivery group; this shows that fall time was longer in the patients who had cesarean due to not progressing during the delivery\textsuperscript{6}.

This study showed that using \textit{Dill} seed affects the pattern of contractions and shortens the fall time; although feedback mechanism is not known, but if fall time was shorter than duration of rise time, vaginal delivery will be performed more successfully. The difference in the F:R ratio between the two groups was small with a wide overlap between them for precluding the use of a F:R cut-off on the labor floor to predictive purposes.

Also, this study showed that number of contractions was more in the group which used \textit{dill} seed than the group which did not use any herbs; moreover, duration of the first stage of labor was shorter. Perhaps, \textit{Dill} seed consumption, due to its content and combination such as limonene and tannin, increases the contractions of uterus and causes better progress of delivery process. Most people in Iran consider herbal drugs as natural, healthy, and without side effects; in this study, were observed related to consumption of \textit{Dill} seed. However, it may cause some maternal fetal side effects or drug intervention; therefore, consumption of herbal drugs should be recommended after performing more studies. Since women use herbal drugs with different doses, it is necessary to perform studies to evaluate the right dose and time of consumption for these drugs.

\textbf{Conclusion}

The results of our study demonstrated that \textit{Dill} seed enhances the frequency of. Fall time in relation to rise time, in the women who used \textit{Dill} seed was shorter than the control group; therefore, it shortens duration of the first stage of labor. \textit{Dill} seed can be used for augmentation of uterine contractions in low risk women in labor, also prevention of post term pregnancy. Recommended that be done more studies about effect of \textit{Dill} seed on delivery and neonatal outcomes. In this study, researchers have investigated the effect of \textit{Dill} seed on the pattern of uterus contractions, and there is no complication.

\textbf{Acknowledgment}

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\textbf{Disclosure statement}

No competing financial interests exist.

\textbf{References}

26 Committee for veterinary medicinal products, EMEA/MRL “Juniperi Froctus is the dried bery like cones of unipers communis”, March 1999.