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Onset of Labor in Post-Term Pregnancy by Chamomile

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Abstract

Background: Post-term pregnancy is an important factor in perinatal mortality and morbidity. Generally, to reduce perinatal mortality in pregnancy, the delivery is done before adverse perinatal morbidity occurs. To prevent prolonged pregnancy, labor is induced with chemical drugs and complementary therapies. Due to the side effects and contraindications of chemical medicine, the use of herbs has been investigated in the induction of labor in post-term pregnancy.
Objectives: This study was done to identify the effect of chamomile on inducing labor in women with post-term pregnancy of Shahid Akbarabadi hospital in Tehran in 2013.
Patients and Methods: This double-blind clinical trial study was performed in Iran on 80 post-term pregnant women with a gestational age of 40 weeks or more, a single pregnancy, 18 - 35 years old, cephalic presentation, an estimated fetal weight of 2500 - 4000 grams, an absence of uterine contraction, a cervical Bishop score of less than 4, the safety of the membrane, and low-risk pregnancy; they were randomly assigned to one of two groups of 40 women. Each of the participants was given a bottle containing 42 capsules (500 mg each) and took 2 capsules every 8 hours. The data were collected through the questionnaire of demographic observational, and examinal characteristics. Descriptive statistics, independent samples t-test, and Fisher's exact test using SPSS (16/win) were used to determine and compare the effects of drugs on inducing labor in the groups.
Results: After a week of using the first dose, the results showed that in 92.5% of the chamomile group and 62.5% in the placebo group, delivery symptoms started after taking the oral capsules, and there were significant statistical differences between the two groups for the onset of labor (P = 0.003) There was a noticeable statistical difference between the two groups regarding the mean interval time to the onset of labor pain after taking the capsules (P = 0.000).
Conclusions: In this study, chamomile stimulated labor in post-term pregnancy. With further studies, chamomile, which has no chemical side effects, can be suggested for stimulating labor in post-term pregnancy.

Keywords: Chamomile, Labor, Post-Term Pregnancy

1. Background

The incidence of post-term pregnancy is 4% -19%, which is an important factor in perinatal mortality (1). Low-risk pregnancy that lasts more than 42 weeks is associated with increased perinatal mortality and morbidity (2), such as increased fetal mortality (3, 4), metabolic acidosis of cord blood and low Apgar scores in the fifth minutes of newborn (5), post-maturation syndrome (6), meconium aspiration syndrome (7), fetal macrosomia (8), and the results are disordered labor, prolonged labor, dystocia, cesarean delivery, and shoulder dystocia that increases neurological damage and breakage in the fetus (9).

Generally, to reduce perinatal mortality in pregnancy, delivery is done before adverse perinatal morbidity occurs. To prevent prolonged pregnancy, labor is induced with chemical drugs and complementary therapies (1). Examples of the drugs that are used are oxytocin and prostaglandins. These drugs, while effective in the induction of labor, have side effects such as hypertonic uterine contractions and subsequent oxygen depletion to the fetus, tearing of the cervix and uterus atonic, postpartum hemorrhage, poisoning of the water, increases in cesarean delivery, chorioamnionitis, nausea, vomiting, diarrhea, and fever (1). The stimulation of labor with chemical drugs requires hospitalization and the care of pregnant women by trained staff, and pregnant women have to be

confined to a bed for fetal monitoring (10).

Treatments such as aromatherapy, massage, and herbal medicine during pregnancy and the last weeks of the final semester of pregnancy can make women feel more relaxed and allow the oxytocin to naturally increase and stress hormone to decrease. As a result, spontaneous labor starts (11-13). The use of complementary therapies can stimulate labor and also reduce stress levels. The use of these treatments increases uterine activity and the satisfaction of pregnant women and their pleasant experience during pregnancy and childbirth (14). In addition to various medical procedures used to induce labor in post-term pregnancy, traditional methods have been used to ease childbirth and the delivery of the fetus and placenta, and to prevent post-term pregnancy. Many of these methods are written in traditional Iranian medicine books. One method is herbal medicine (15, 16).

Cedrus Libani Barrei, Caesalpinia Bonducella, Aristolochi Abracteata, chamomile, Cicer arietinum, and Dorema ammoniacum are old herbs that have been used (15). Among these plants, chamomile has been chosen as a tea and food spice since it is non-toxic and the most effective herb after Aristolochi Abracteata and Caesalpinia Bonducella herbs (of which the toxicology is still unknown) (17).

Since ancient times, chamomile has been used for tonic, pain relief, nerve relief, sedation, appetite stimulation, stomach stimulation, healing, and anti-viral and bacterial, anti-cancer, anti-anemia, and emmenagogue treatment (17). Herbs such as chamomile and blue and black Kohosh are oxytocic drugs and stimulants for uterine contraction (18).

As no side effects for chamomile have been reported (15, 17, 19-22), this herb is used natively. As a result, we want to examine whether, in comparison with common methods of labor induction, this is an effective, low-risk method.

2. Objectives

As post-term pregnancy is an important factor in perinatal mortality and has undesirable maternal and neonatal results, this study was conducted to identify the effect of chamomile on inducing labor in women with post-term pregnancy in Shahid Akbarabadi hospital in Tehran in 2013.

3. Patients and Methods

This study was a double-blind clinical trial conducted on 80 primipara women, with a gestational age of pregnancy of 40 weeks or more, who went to the prenatal clinic at Akbar Abadi hospital for care between July 2013 and March in 2014. Inclusion criteria for participating in this study were as follows: 18 - 35 years of age, gestational age of 40 weeks or more based on LMP or first-trimester ultrasound, a single pregnancy, cephalic presentation, no specific sickness and problems in the mother and fetus, a live fetus, estimated fetal weight of 2500 - 4000 g based on ultrasound or clinical examination, an absence of uterine contractions, a cervical Bishop score of less than 4, the safety of the membrane, a normal fetal heart rate upon entering the study, and low-risk pregnancy (no bleeding in the third trimester, placenta previa, abortion, fetal growth restriction). Exclusion criteria for participating were as follows: withdrawal from the study at any stage of the study, not referring to perinatal care, and consuming less than 3 capsules per day.

Our research community was comprised of pregnant women who referred to the prenatal clinic of Akbar Abadi hospital in Tehran. After obtaining permission from the ethics committee of Tehran University of Medical Sciences (ethical code A401/130/D/92. date 12.03.1392) and after obtaining permission from the faculty, research assistant, department, and nurse's office of the hospital, the researcher and her associate went to the prenatal clinic of the hospital every day and introduced themselves to the pregnant women in the hospital and explained the research objectives to women who were eligible for inclusion in the study. After learning the details of the study and providing informed consent, they were placed randomly in two groups, a chamomile group and a placebo group. A demographic questionnaire and preliminary examinations were completed. The time when each woman entered into the study was recorded. Each of the participants was given a bottle containing 42,500 mg capsules and took 6 capsules per day (2 capsules every 8 hours). Participants were called every 24 hours to report on their condition. Participants were also advised to refer to the clinic for control every other day. Participants were given instructions to examine their fetal movements and to go to the hospital and contact the researcher if they had discharge, bleeding, severe abdominal pain, decreased fetal movements, and abnormalities of any kind. They were also advised that if they felt pain, a ruptured membrane, and bleeding, to record the exact time. When they came in for delivery, the researcher went to them and recorded their review of all information in examination sheets and in questionnaires. The time of onset of drug use and delivery were recorded. All participants were evaluated up to 7 days after entering the study. If they did not respond to this treatment, induction and pharmacological interventions were initiated. Out of the 90 pregnant women who voluntarily entered the study, 6 women avoided taking capsules, and 4 women took 2 capsules in a day; thus, they were excluded from the research.

To determine the sample size and the effective dose, a pilot study was performed on 20 participants. After a thorough analysis of the results using a statistical formula, the sample size and the effective dose were determined. Chamomile and placebo capsules (corn starch) were prepared and encoded in the same bottle by Traditional medicine groups of Shahed University of Medical Sciences.

The data collection tool was a questionnaire. To determine the validity of the questionnaire, apparent and content validity were used. To determine the reliability of the researchers, the same time observation method was used. That is, questionnaires were made for 10 investigators and researchers at the start of the research, and if the results were the same, the reliability is confirmed.

The Q-square test was used for the level of education, employment status, gestational age at the start of the study, and the cause for admission in the hospital. We used the Kolmogorov-Smirnov test to assess the normality of variables. All quantitative variables had normal distribution; thus, we used the t-tests to analyze them. The independent t-test was employed for age, body mass index, and the interval of time between the use of the drug or placebo and the start of labor. Fisher's exact test was also utilized for the onset or no onset of labor and delivery type. Data were analyzed using SPSS version 16. For all tests, $\alpha = 0.05$ was accepted for errors.

4. Results

The findings indicated no significant statistical differences between the two groups (40 pregnant women receiving chamomile versus 40 receiving a placebo only) in terms of age, pre-pregnancy body mass index (Table 1), education, employment, and gestational age upon entering the study (Table 2). After a week of using the first dose, in 92.5% of the chamomile group and 62.5% of the placebo group, delivery symptoms started after taking the oral capsules. Statistical analyses revealed significant statistical differences between the chamomile and placebo groups for the onset of labor (P = 0.003) (Table 3). The percentage of women showing symptoms of labor was 48.6% in the chamomile group and 52% in the placebo group who referred to the hospital with painful uterine contractions and 43.62% in the chamomile group and 44% in the placebo group who complained of uterine contractions and a ruptured membrane. In Table 4, the reasons for referring to the hospital's emergency room are shown. Out of 37 women in the chamomile group and 25 women in the placebo group who entered in the delivery phase, the interval of time between entering the study to the start of labor was 62.705 hours in the chamomile group and 106.456 hours in the placebo group. This difference was significant (P = 0.000) (Table 5).

Table 1. Demographic Data (Age, Pre-Pregnancy Body Mass Index) of the Groups

Groups	Chamomile	Placebo	P Value
Age, y	24.42 ± 4.76	24.57 ± 3.75	0.876
BMI, kg/m^2	22.55 ± 2.009	22.53 ± 2.109	0.973

Table 2. Demographic Characteristics (Education, Employment, and Gestational age at Enrollment) of the Groups[a]

Group	Chamomile	Placebo	P Value
Education			0.633
Without education	1 (2.5)	1 (2.5)	
Elementary and middle school	11 (27.5)	13 (32.5)	
High school diploma	25 (62.5)	20 (50)	
University	3 (7.5)	6 (15)	
Employment			0.5
Home work	40 (100)	39 (97.5)	
Employed	0 (0)	1 (2.5)	
Gestational age at enrollment			0.943
40 Weeks	18 (45)	18 (45)	
40 weeks and 1 day	10 (25)	9 (22.5)	
40 weeks and 2 days	11 (27.5)	11 (27.5)	
40 weeks and 3 days	1 (2.5)	2 (5)	

[a]Values are expressed as No. (%).

Table 3. Onset of Labor in the Two Groups

Groups	Chamomile	Placebo	P Value (Fisher's Exact Test)
Yes	37 (92.5)	25 (62.5)	0.003
No	3 (7.5)	15 (37.5)	0.003

5. Discussion

This research was done to study the effect of chamomile on inducing delivery in post-term pregnancy. The findings showed that labor started in 92.5% of the chamomile group and 62.5% of the placebo group one week from the start of taking capsules (P = 0.003). A double-blind clinical study was done by Yargholi et al. (23) to explore the effect of chamomile herbal tea during pregnancy on childbirth in the term pregnancy. Little

Table 4. Reason for Admission for Delivery in the Two Groups

Groups	Chamomile	Placebo	P Value
Onset of regular uterine contractions	18 (48.6)	13 (52)	0.88
Onset of regular uterine contractions and decreased fetal movement	2 (5.4)	1 (4)	0.88
Onset of regular uterine contractions and ROM	16 (43.62)	11 (44)	0.88
Onset of regular uterine contractions , decreased movement and bleeding	1 (2.7)	0	0.88

Abbreviation: ROM, rupture of membrane.

Table 5. Interval of Time Between Taking Capsules and the Onset of Labor Symptoms (Hours)

Groups	Mean ± SD	P Value
Chamomile	62.705 ± 32.556	0.000
Placebo	106.456 ± 24.475	0.000

difference was observed in gestational age in the time of delivery (after the consumption of herbal tea) between the chamomile and placebo groups (P = 0.689). In spite of the lack of significant statistical differences between the two groups, this study found that post-term pregnancy in the placebo group was more than chamomile group. Burns et al. in 2003 (19) conducted a study with the aim of investigating the therapeutic effects of aromatherapy with oils of chamomile, sage, frankincense, lavender, and mandarin on delivery outcomes in Italy. This study represented no significant statistical difference between the two groups in initiating spontaneous labor. The results of these studies differed from ours.

Our findings indicate that the mean interval time of the start of labor pain after taking the capsules was 62.705 ± 32.556 hours in the chamomile group and 106.456 ± 24.475 hours in the placebo group. This showed that the gestational age at the time of delivery in the chamomile group was shorter than the placebo group. The independent t-test results indicated a noticeable statistical difference between the two groups in terms of the interval time's mean onset of labor (P = 0.000). No other studies have shown the time of labor induction, which may be because of the limited number of studies in this field.

As one of the consequences of post-term pregnancy is stress and fear due to the failure to initiate labor (24), the stress and anxiety can increase the amount of adrenalin and adrenocorticotropic hormone release. These materials are anti-oxytocic, or anti-uterine contraction, and thus delay delivery (13). The use of relaxing treatment by reducing the levels of adrenalin and noradrenalin and removing the inhibitory effects of adrenalin and increasing oxytocin can increase miometrial functions and uterine contractions (13). After the release of oxytocin, the time and severity of contractions increase; in addition, chamomile is a relaxing plant (17). Herbs such as chamomile and blue and black cohosh are known uterine-stimulating drugs and have an oxytocic effect (18). According to this study, it seems that this herb can induce labor in post-term pregnancy.

It is suggested that clinical trial studies be done by comparing with common procedures. Laboratory studies should be done to investigate the biochemical effects of chamomile on the control of uterine contractions. Other studies with various pharmaceutical forms of chamomile can be undertaken. Surveys should be conducted to compare the effect of chamomile with syntocinon and other interventions.

Our study had several limitations. First, it was done on pregnant women in one hospital who were probably not the suitable representatives of all of pregnant women, and the results cannot be generalized to all post-term pregnant women. In addition, women in this hospital were from certain socioeconomic classes. Some of the factors influencing pain intensity, such as culture and nutrition, were uncontrollable. It seems that certain factors, such as culture and awareness of people, influenced the use of herbal medicine and the onset of labor. This study was performed at an educational hospital that had uncontrolled and high interventions for patients, which may have affected the results of the study.

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Footnotes

Authors' Contribution: Fereshte Gholami and Leila Neisani Samani participated in the design and data collection and writing of the manuscript. Maryam Kashanian participated in the design and writing of the manuscript. Mohsen Naseri participated in the design, production of medicine, and writing of the manuscript. Agha Fateme Hosseini participated in the design, data collection, statistical analysis, and writing of the manuscript. Seyed Abbas

Hashemi Nejad helped with data collection, preparation, and manufacturing drugs.

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