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OBSTETRICS

The effect of late pregnancy consumption of date fruit on labour and delivery

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Summary

We set out to investigate the effect of date fruit (*Phoenix dactylifera*) consumption on labour parameters and delivery outcomes. Between 1 February 2007 and 31 January 2008 at Jordan University of Science and Technology, a prospective study was carried out on 69 women who consumed six date fruits per day for 4 weeks prior to their estimated date of delivery, compared with 45 women who consumed none. There was no significant difference in gestational age, age and parity between the two groups. The women who consumed date fruit had significantly higher mean cervical dilatation upon admission compared with the non-date fruit consumers (3.52 cm vs 2.02 cm, $p < 0.0005$), and a significantly higher proportion of intact membranes (83% vs 60%, $p = 0.007$). Spontaneous labour occurred in 96% of those who consumed dates, compared with 79% women in the non-date fruit consumers ($p = 0.024$). Use of prostin/oxytocin was significantly lower in women who consumed dates (28%), compared with the non-date fruit consumers (47%) ($p = 0.036$). The mean latent phase of the first stage of labour was shorter in women who consumed date fruit compared with the non-date fruit consumers (510 min vs 906 min, $p = 0.044$). It is concluded that the consumption of date fruit in the last 4 weeks before labour significantly reduced the need for induction and augmentation of labour, and produced a more favourable, but non-significant, delivery outcome. The results warrant a randomised controlled trial.

Keywords: Augmentation, caesarean section, date fruit, induction, oxytocin, *Phoenix dactylifera*

Introduction

The date fruit, *Phoenix dactylifera*, contains a high percentage of carbohydrate, fat, 15 types of salts and minerals, proteins, and vitamins (Al-Shahib and Marshall 2003). Date fruit is also high in dietary fibre, reported as being between 6.4% and 11.5% among 14 varieties, with both saturated and unsaturated fatty acids occurring in both the seed and the flesh (Al-Shahib and Marshall 2003). In light of the information available regarding general nutritional value and potential health benefit of dates, and given what is known about the benefits of good nutrition for pregnant women, the date fruit appears to be a reasonable food choice for pregnant women as part of a well-balanced diet. There is also anecdotal evidence to suggest that date fruit can contribute significantly to a healthy pregnancy by means of preventing anaemia, reducing nausea, controlling blood pressure, regulating blood sugar levels, helping to restore depleted calcium, expelling toxins, and increasing strength and immune resistance (Al-Shahib and Marshall 2003).

Although oxytocin is routinely used to control postpartum bleeding (Nordstrom 1997), in a recent non-randomised clinical trial that compared date fruit and oxytocin after placenta delivery, the ingestion of date fruit significantly reduced the amount of bleeding compared to oxytocin in the first hour following placental delivery, due to the presence of compounds in date fruit that mimicked the action of oxytocin (Khadem 2007).

The aim of this study was to investigate delivery parameters in two groups of women on the basis of their consumption, or otherwise, of date fruit before labour.

Materials and methods

This was a prospective study of nulliparous and primiparous women with singleton pregnancies, who attended the Jordan University of Science and Technology, Irbid, Jordan, for their antenatal care and delivery between 1 February 2007 and 31 January 2008. The inclusion criteria were gestational age of 36 weeks by early pregnancy dating, and without any chronic illnesses or antenatal complications (low-risk pregnancies) in the current or last pregnancy. The rationale for choosing the last 4 weeks of pregnancy was empirical. The date fruit consumption status of the women before they entered the study was none.

After explanation and enrolment in the study, women were asked to participate in one of two groups in open label fashion, with an instruction against cross movement. The first group of women were given a supply of date fruit and instructed to take six pieces per day until the onset of labour pains, and to keep a note of their intake. This equated to a daily intake of approximately 60–67 g. The second group of women were not given date fruit and were asked to abstain from consuming date fruits for the period of the study, but were otherwise monitored and given the same care as the first group. As date

fruit consumption is a part of the cultural beliefs of the population under study, it was difficult to get patients who would commit to not taking date fruit at all (control group), therefore the study group had more patients than the control group.

The following parameters were measured on arrival of the participants to the labour suite: cervical dilatation upon admission (cm); whether amniotic membranes were intact (yes/no); duration of the latent phase of the first stage of labour (time from admission until the patient was 3 cm. The observation made on the latent phase was explained by the fact that the distinction between latent (or false) labour and active labour is often difficult, as the latent phase of labour may be highly variable. The dilatation of 3 cm was taken as a baseline from which active labour begins); duration of the active phase of the first stage of labour (time from 4 to 10 cm); duration of second stage of labour (time from full dilatation until delivery of the fetus); duration of the third stage of delivery (time from delivery of the fetus until delivery of the placenta); whether there were spontaneous labour pains, or whether labour had to be induced; whether a oxytocin drip had to be started or prostin vaginal tablets given; or whether neither were given (yes/no); and mode of delivery (normal vaginal delivery, ventouse delivery, or use of forceps versus caesarean section). These parameters, as well as physical age, gestational age and parity were also recorded in Excel sheets (Microsoft Inc., Redmond, WA).

Parameters were analysed using SPSS, version 15 (SPSS Inc., Chicago, IL). Categorical parameters were analysed by χ^2 -test, or by Fisher's exact test in a case in which any cell size was ≤ 5 . Continuous parameters were analysed using Student's *t*-test calculated according to whether Levine's test for equality of variances was significant or not. A *p* value of <0.05 was considered to be significant.

Institutional Review Board approval was obtained to conduct the study. Verbal consent was obtained from participants to enter the study.

Results

During the study period, between 1 February 2007 and 31 January 2008, 114 women were recruited. The date fruit group comprised 69 women, while the non-date fruit group comprised 45 women. There was no significant difference between the two groups in regard to age and parity. The mean age of all participants was 25.8 years, 78% were nulliparous and 22% were primiparous. The mean gestational age of the date fruit group was 275.5 days, SD = 15.73, and 276.2 days, SD = 10.03, for the non-date fruit group. This difference was not statistically significant.

For cervical dilatation on admission, the differences were statistically significant, with a higher mean of 3.52 cm for the date fruit group (SD 2.46) compared with the non-date fruit group, with a mean of 2.02 cm (SD 1.48) (mean difference 1.50, 95% CI 0.77–2.23, *t* 4.055, df 111,44, *p* < 0.0005).

The difference in the status of the amniotic membranes, the type of onset of labour and the need for prostin/oxytocin utilisation was statistically significant as 28% of women in the date fruit group required the use of prostin/oxytocin compared with 43% in the non-date group. The caesarean section difference between the two groups was not statistically significant (Table I).

The duration of each stage of labour and the vaginal delivery rates were not significantly different between the two

groups, although the date fruit group had a substantially shorter first stage compared with the non-date fruit group. However, the latent phase of the first stage was significantly different between the two groups (Table II).

Discussion

To our knowledge, this is the first study to investigate the effect of date fruit consumption on labour parameters and delivery outcomes. Prostaglandins and oxytocin are widely used to stimulate uterine contractions, to induce or augment labour, particularly when the latent phase of the first stage of labour becomes prolonged (Hayes and Weinstein 2007; Daniel-Spiegel et al. 2004; Jamal and Kalantari 2004; Svärby et al. 2007). In the USA, induction of labour is one of the most commonly performed obstetrical procedures (Martin et al. 2003). Between 1990 and 2004, the frequency of labour induction approximately doubled, rising from 9.5% to 21%, and approximately 15% of all labours were augmented, while in developing countries, augmentation varied widely from 4% to 91% (Rayburn and Zhang 2002; Merrill and Zlatnik 1999; Dujardin et al. 1995; Khalil et al. 2004). Although the judicious use of oxytocin for cervical ripening or labour induction is a relatively safe procedure, in some developing countries it has been associated with inappropriate use or inadequate monitoring, which substantially increases the risk for adverse outcomes (Khalil et al. 2004; Jeffery et al. 2007). Therefore, we would argue that any simple procedure that reduces the need for induction or augmentation is worthy of investigation.

In this study, based primarily upon anecdotal evidence, we investigated whether the addition of date fruit for the last few weeks of pregnancy would reduce the need for induction or augmentation. There are several indications that this occurred. First, cervical dilation was significantly increased in the date fruit group compared with the non-date fruit group women arriving at the labour suite. Second, there was a

Table I. Labour ward admission and delivery outcome of 114 women in relation to date fruit consumption.

Admission and delivery parameters	Date fruit group (n = 69)		Non-date fruit group (n = 45)		<i>p</i> value
	<i>n</i>	(%)	<i>n</i>	(%)	
Presence of intact membranes on admission	57	83	27	60	0.007
Onset of spontaneous labour	66	96	37	79	0.024
Need for labour induction/augmentation	19	28	21	47	0.036
Caesarean section	9	13	12	27	>0.05

Table II. Parturition data in minutes of 114 women in relation to date fruit consumption.

Parturition details	Date fruit group (n = 69)		Non-date fruit group (n = 45)		<i>p</i> value
	Mean	± SD	Mean	± SD	
Latent phase	510	346	906	762	0.044
First stage	231	147.7	275	116	>0.05
Second stage	46.7	45.12	48.1	42.4	>0.05
Third stage	10	7.45	9.94	4.1	>0.05

significantly higher rate of spontaneous labour in the date fruit group compared with the non-date fruit group. Third, 28% of women in the date fruit group required the use of prostin/oxytocin compared with 43% in the non-date fruit group. Fourth, the apparent latent phase of the first stage of labour was 38% shorter in the date fruit group compared with the non-date fruit group. It is speculated that dates work on oxytocin receptors and induce earlier uterine contractions and improve response to syntocinon if needed. Another is the possibility of improved immunity to infection, with subsequent less incidence of pre-labour rupture of membranes. Although women in the date fruit group had fewer caesarean sections compared with the non-date fruit group, this result was not significant, and thus we do not know from a small study whether date fruit would have a significant effect in regard to method of delivery.

There were some limitations to this study. First, it was not known how much of an effect the number of date fruit has in terms of outcomes. Second, the optimum length of time for which date fruit should be consumed in relation to estimated delivery date needs to be determined. Last, analysis of delivery outcome using a regression model with the application of Bonferroni correction would have added to the significance of the findings of this study.

Nevertheless, the overall results in this pilot study suggest positive outcomes in regard to date fruit use. The authors believe that the evidence presented is sufficient to warrant a randomised controlled trial to further explore outcomes. Most importantly, since date fruits are readily available in most countries, and are easily transportable due to their relatively very long shelf life, our study suggests that the use of date fruit in the last month of pregnancy could help reduce the need for induction or augmentation, while at the same time improving outcomes. This is particularly important in situations in which limited care might be available.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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