RASPBERRY LEAF AND ITS EFFECT ON LABOUR: SAFETY AND EFFICACY

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ABSTRACT

The purpose of this study was to examine the safety and efficacy of raspberry leaf products consumed by a group of mothers during their pregnancy, by comparison with a group of mothers who did not. A retrospective observational design was used. Subjects were women who birthed their babies at Westmead Hospital between January 1998 - July 1998. The sample consisted of 108 mothers; 57 (52.8%) consumed raspberry leaf products while 51 (47.2%) were in the control group. The findings suggest that the raspberry leaf herb can be consumed by women during their pregnancy for the purpose for which it is taken, that is, to shorten labour with no identified side effects for the women or their babies. The findings also suggest ingestion of the drug might decrease the likelihood of pre and post-term gestation. An unexpected finding in this study seems to indicate that women who ingest raspberry leaf might be less likely to receive an artificial ruture of their membranes, or require a caesarean section, forceps or vacuum birth than the women in the control group.

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Keywords: labour, pregnancy, raspberry leaf, safety.

INTRODUCTION

There is a belief within the community that the raspberry leaf herb, taken in tablet or herbal tea form during pregnancy, shortens labour and makes labour 'easier'. Pregnant women take raspberry leaf in some form during pregnancy under the advice of book and magazine authors and advertisements, friends, relatives, neighbours, health food store salespersons, naturopaths, herbalists, doctors and midwives. To the investigators' knowledge, the effect of raspberry leaf during pregnancy on the labour, birth and postpartum period has never been examined, except in laboratory studies (Whitehouse, 1941; Burns & Withell, 1941). All information regarding the effect of raspberry leaf on parturient women has been anecdotal to date.

This article is based on a study that was designed to investigate the safety and efficacy of the raspberry leaf herb, ingested by women during their pregnancy, on their labour and birth outcomes. In particular, consideration was given to:

1. any adverse effects on the mother (eg., an increase in blood pressure, or an increase in blood loss at birth) or the baby (eg.,lower apgar score at birth, or an increase in the admissions rate to the Neonatal Intensive Care or Special Care Nurseries);
2. any impact on the prebirth period, particularly gestation and during labour (eg., preterm or post-term onset of labour);
3. any reduction in the likelihood of interventions during labour and birth (eg. medical or surgical augmentation of labour, epidural anaesthesia, or increased rate of forceps, ventouse or caesarean section delivery).

REVIEW OF THE LITERATURE

"The raspberry leaf plant (Rubus idaeus Linn., Family: Rosacea) has been used medicinally for centuries - certainly as early as the sixth century" (Beckett, et al., 1954, p.785). Burn and Withell stated that the raspberry leaf herb is "the best known and oldest of

all the herb infusions and [is] included as a proved aid in maternity in the most ancient of herbal books" (1941, p.2).

An experiment on cats performed by Burn and Withell (1941) found that an intravenous injection of raspberry leaf extract had a relaxant effect on the uterine muscle of these cats. Whitehouse (1941) also found that uterine contractions diminished in frequency and strength and secondary contractions were eliminated in those women given 20 - 40 grams of raspberry leaf extract (fragarine) in the first few days after birth. The relaxant effect of raspberry leaf extract noted by Burn and Withell was later interpreted as "producing more coordinated uterine contractions" in labour by Bamford et al (1970, p.162). As Bamford et al (1970) explained, a major problem in obstetrics "is incoordination of uterine action, and it may be that raspberry leaf extract is able to modify the course of labour favourably to produce more coordinated uterine contractions" (1970, p.162). This is the theory which underpins the research questions.

The only side effect of raspberry leaf extract noted by Burn and Withell (1941) and Whitehouse (1941) was an accompanying change in blood pressure. Burn and Withell (1941) noted a rise in blood pressure while Whitehouse (1941) found instead a slight fall in systolic blood pressure.

In naturopathic literature raspberry leaf is found to have many remedial effects. Castleman (1991) wrote of the use of raspberry leaf preparations for morning sickness, uterine irritability, and threatened miscarriages and even states that women with a history of miscarriage may find it especially valuable. According to Hoffman (1990), the uterus is strengthened and toned by the regular ingestion of raspberry leaf throughout pregnancy and labour, assisting contractions and checking any haemorrhage during labour, a statement supported by Mills (1989). Interestingly, medical opinions are often opposed to the use of raspberry leaf saying that it causes miscarriage and premature labour although only one reference can be found in the literature to support this belief. The Pharmaceutical Society of Great Britain (1996) reported a study performed in 1970 which found that raspberry leaf initiated contractions in strips from human uteri at 10 - 16 weeks of pregnancy.

As can be seen in this literature review, experiments with raspberry leaf are now dated (1941 & 1970). Although much is written of the benefits of raspberry leaf, especially for pregnancy and childbirth, the only research based references are from the works of Burn and Withell (1941) and Whitehouse (1941) and Bamford et al (1970).

ETHICS APPROVAL

The study was undertaken with approval by the Western Sydney Area Health Service Human Research Ethics Committee.

Consent was obtained from all women participating in the study and confidentiality was assured. The consumption of raspberry leaf during pregnancy, by the women in the study, was in no way influenced by the investigators or associates, hence the retrospective design of the study.

METHOD

Design and Setting

The study utilised a retrospective design. Data were collected from the questionnaire (see appendix) and obstetric database at Westmead Hospital, a tertiary referral hospital in Sydney, between January 1998 and July 1998.

Subjects and Sampling

Participants in this research (n=108) were women who birthed a baby at Westmead Hospital (including private, public, and the Team Midwifery Program women) between January 1998 and July 1998. The experimental group was a convenience sample obtained during their postnatal hospital stay. The women were approached and asked if they had consumed raspberry leaf products during their pregnancy. All women who responded in the affirmative (n=57) completed a questionnaire and gave permission for data to be collected from their hospital files. The control group (n=51) were randomly selected from the hospital records of the women who stated they did not take raspberry leaf products during their pregnancy and who consented to their medical records being accessed.

Instruments

The investigators collected the data required for the study from the hospital obstetric data base and clients medical records (see Table 1), and from a questionnaire given to the raspberry leaf consumers.

The questionnaire provided data regarding the type, dosage, and duration of raspberry leaf consumption

plus the participants subjective information in regards to the raspberry leaf herb.

TABLE 1
Data Collected from Hospital Obstetric Data Base and Medical Records

Demographics	Antenatal	Intrapartum	Baby
• Age	• Blood Pressure	• Epidural (pre-labour)	• Apgar at 5 mins. • Meconium liquor
• Ethnicity	• Weight at first antenatal visit	• Length of each stage of labour	• Gestation at birth
• Public or Private		• Mode of birth • Blood loss	• Admission to: - Neonatal Intensive Care - Special Care Nursery
• Parity		• Augmentation - surgical - medical	

Data Analysis

The data were analysed using the Statistical Package for the Social Sciences (PC-Version). The data were examined using descriptive statistics, contingency tables and t-tests. All t-tests were applied as two-tailed tests.

RESULTS

Equivalence of Groups

The total sample was 108, which included 57 (52.8%) in the raspberry leaf group and 51 (47.2%) in the control group. The demographic characteristics of the sample are displayed in Table 2.

TABLE 2
Demographic Comparison of Raspberry Leaf and Control Group

	Raspberry Leaf (N = 57) 52.8%	Mean	Control (N = 51) 47.2%	Mean	t(p)
Spread of Age (yrs)	17 - 39	28.72	21 - 45	30.35	1.73(0.086)
Primigravidas	34 (59.6%)		26 (51.0%)		
Multiparous	23 (40.4%)		25 (49.0%)		
Ethnicity					
Caucasian	54 (94.7%)		43 (84.3%)		
Asian	3 (5.3%)		7 (13.7%)		
South Pacific Islander	0		1 (2.0%)		
Private patients	26 (45.6%)		18 (35.3%)		
Public patients	31 (54.4%)		33 (64.7%)		
Maternal weight at booking (kg.)	43 - 108	67.75	49 - 105	67.26	.19(0.85)

The sample consisted of a majority of Caucasian women. The average age was 28.72 years (SD=4.46) for the raspberry leaf group and 30.35 years (SD=5.347) for the control group. There was some difference between the groups on this variable (t=1.73, df=106, p=.086). This was a function of the sampling procedure.

The average weight of the raspberry leaf group was 67.75 kg (SD=12.43) and 67.25 kg (SD=13.41) for the control group (weight data was missing for 8 subjects). There was no difference between the groups on this variable (t=.19, df=98, p=.85).

The raspberry leaf group consisted of 59.6% primiparous women and 40.3% multiparous women while the control group consisted of 51.0% primiparous women and 49.0% multiparous women. There was no real difference between the two groups for this variable (X^2=.82, df=1, p=.37).

There were 45.6% of women in the raspberry leaf group who received private obstetric care and 54.4% were public patients, while the control group consisted of 35.3% who received private obstetric care and 64.7% were public patients (X^2=1.206, df=1 , p=.27). This difference was a consequence of the sampling procedure. Thus the two groups were comparable for weight, parity, ethnicity and level of obstetric care, and relatively comparable for age.

Description of Raspberry Leaf Consumption

Table 3 shows the mode of consumption of raspberry leaf during the pregnancies of mothers in the raspberry leaf group. These women commenced raspberry leaf as early as 8 weeks gestation with 13% commencing between 8 - 28 weeks, 59% from 30 - 34 weeks, and 28% from 35 - 39 weeks. The duration of consumption of the raspberry leaf products was over a 1 - 32 week continuous period.

TABLE 3
Raspberry Leaf Consumption

	Raspberry Leaf Tea Cups	Raspberry Leaf Tablets	Combination of Raspberry Leaf Tea/Tab/Tincture
Sample size	32 (56.1%)	23 (40.4%)	2 (3.5%)
Dosage			
1 cup or tablet per day	7 (21.9%)	2 (8.7%)	1
2 cups or tablets per day	7 (21.9%)	4 (17.4%)	
3 cups or tablets per day	10 (31.3%)		
4 cups or tablets per day	5 (15.6%)	5 (21.7%)	1
5 cups or tablets per day	1 (3.1%)	1 (4.3%)	
6 cups or tablets per day	2 (6.2%)	10 (43.5%)	1
7 cups or tablets per day			
8 cups or tablets per day		1 (4.3%)	
1 dose of tincture			1

When women were asked if they thought the raspberry leaf they had consumed in their pregnancy had shortened their labour and birth 68.4% answered 'yes', 7% 'no', and 24.6% stated they were 'undecided. When asked if they would consider taking raspberry leaf in their future pregnancies or, if they would recommend this herb to a friend, they respectively replied 84.2% and 86% 'yes', 3.5% and 8.7% 'no', and 12.3% and 5.3% were 'undecided'.

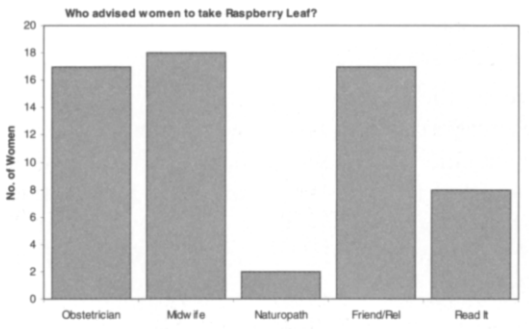
Six women chose to cease the consumption of raspberry leaf during their pregnancy for the following reasons:

- 2 women did not like the taste of the tea
- 1 woman stated she "took castor oil instead"
- woman stated she had "early labour pains" (this was the onset of full term labour)
- 1 woman experienced an "increase frequency of Braxton Hicks"
- 1 woman experienced an episode of diarrhoea after consuming raspberry leaf tablets for only one week at 32 weeks gestation and did not resume raspberry leaf after diarrhoea had settled.

All other women stated they ceased taking raspberry leaf prior to the onset of their labour.

Women were recommended to consume the raspberry leaf herb during pregnancy by a number of sources including their obstetrician, midwife, naturopath, friend, relative, or they read about it in a magazine (see Figure 1).

FIGURE 1



Consideration of Safety Issues

The safety aspect of raspberry leaf consumption in pregnancy was considered using the following variables: maternal blood loss at birth, babies' Apgar score at 5 minutes of age, and maternal diastolic blood pressure pre labour. There were no differences of clinical significance demonstrated in any of these variables.

Maternal blood loss at birth was measured on 93 of the mothers. The 15 mothers who were delivered by caesarean section were left out of the analysis. Only 6 (6.5%) of the total sample (n=93) had a blood loss >600 mls with 4 of them in the raspberry leaf group (X^2=.36, df=1, p=.55).

With only one baby receiving an Apgar score <6 at 5 minutes, there was basically no difference between the two groups on Apgar score (X^2=.91, df=1, p=.33).

Among readings of pre labour diastolic blood pressure were not available for 11 subjects. Among the balance of the sample (N=97) only six (6.2%) had a pre labour diastolic blood pressure measure in excess of 90. Of these 4 were in the raspberry leaf group (X^2=.50, df=1, p=.47). These 6 women were not the same 6 women who had a blood loss >600 mls.

Labour and Birth Outcomes

The possible impact of raspberry leaf consumption was examined by comparing the raspberry leaf (RL) and control (C) groups on a range of relevant variables.

On average the gestation period of each group of mothers was the same [M_{RL}=283.93, M_C=281.47, t(106)=1.25, p=.215]. There was, however, a marked difference in the standard deviation of this variable between the two groups [SD_{RL}=8.20, SD_C=12.10, f(50,56)=3.43, p=.067].

There was no difference between the groups on the likelihood of medical augmentation of labour (X^2=.0, df=1, p=1.0). Although not statistically significant, there was a greater likelihood of artificial rupture of membranes in the control group (27/51, 52.9%) compared with the raspberry leaf group (22/57, 38.6%) (X^2=2.2, df=1, p=.13).

No difference was found between the two groups on the occurrence of meconium liquor (X^2=.07, df=1, p=.78) or the need for an epidural block (X^2=.02, df=1, p=.87) during labour and delivery.

Basically there was no difference between groups in the likelihood of babies being transferred to Special Care Nursery or Neonatal Intensive Care Nursery

following birth. Only 7 (6.5%) babies were transferred to these nurseries.

The analyses of time in first and third stages of labour excluded mothers who gave birth by caesarean section. The analyses of time in second stage labour excluded mothers who were delivered by caesarean section, forceps or ventouse extraction.

TABLE 4

Length of Labour in Minutes

	Raspberry Leaf Group			Control Group					
	N	Mean	SD	N	Mean	SD	t	df	p
First Stage	52	301.6	212.5	43	387.8	349.8	1.41*	93	0.17
Second Stage	44	49.2	47.9	34	40.4	32.2	0.92	76	0.36
Third Stage	52	12.1	26.3	43	10.6	18.1	0.33	93	0.74

* (Assuming unequal variances)

The variances in measures of time for first stage labour differ markedly between the groups [SD_{RL}=349.8, SD_C=212.5, f(42, 51)=7.73, p=.007]. Hence the unequal variance assumption was applied in the t-test of difference between means (Table 4)

As Table 4 demonstrates, there were no statistically significant differences between the groups on mean time in second and third stage of labour. However, as well as the spread of time measures in the first stage of labour being significantly smaller in the raspberry leaf group compared with the control group, the mean time in first stage of labour is also substantially lower in the raspberry leaf group (M_{RL}=301.6, M_C=387.3, t=1.41,df=93, p=.165), although not a statistically significant difference.

TABLE 5

Delivery Outcome

	Raspberry Leaf Group (N=57)	Control Group (N=51)	Total (N=108)
Normal Delivery	44	34	78
Forceps/Ventouse	8	9	17
Caesarean Section			
- Elective	1	3	4
- Emergency	4	5	9
			(X^2=1.48,df=1,p=.22)

The percentage of normal deliveries in the raspberry leaf group (44/57, 77.2%) was slightly larger than the percentage in the control group (34/51, 66.7%) (X^2=1.48, df=1, p=.22) (see Table 5).

DISCUSSION

To date, no study has specifically investigated the relative effectiveness of the raspberry leaf herb, ingested during pregnancy, on the labour and birth process or the possible side effects it may have for the women ingesting this herb or for their babies. In this retrospective study quantitative and qualitative data were collected via the patients hospital records as well as a questionnaire to provide baseline data which adds weight to the believed safety and efficacy of this herb.

According to the data collected and the final analyses the raspberry leaf herb appeared to be safe for pregnant women and their babies during pregnancy, labour and birth, and in the early postpartum period. Only one woman reported an incident of diarrhoea after taking raspberry leaf for one week. Diarrhoea is one of the known side effects of raspberry leaf if taken in greater than therapeutic dose. As the woman did not resume raspberry leaf when diarrhoea had ceased it is unknown if raspberry leaf was the cause or if a reduced dose of raspberry leaf would have prevented further diarrhoea. Anecdotally women occasionally complain of strong Braxton Hicks contractions (normal contractions of pregnancy) while taking raspberry leaf herbs and it was found in this study that one woman did stop taking raspberry leaf for this reason during her pregnancy. It has been suggested that these women should be advised to reduce the dosage of raspberry leaf to help reduce these contractions. As pregnant women complain of strong Braxton Hicks contractions even when not ingesting raspberry leaf products it is unknown if these contractions are strengthened by raspberry leaf or if they are normal for some women.

Due to the study design, being a retrospective observational study, there was no attempt to control for extraneous variables, such as, the timing and amount of the consumed raspberry leaf products, the parity of the women, the care provider (private, public, team midwifery), and the labour and birth outcomes.

A convenience sampling procedure was conducted and, unfortunately, the attempt to estimate the percentage of pregnant women at Westmead Hospital consuming raspberry leaf products had to be abandoned due to the inconsistency of the recruitment procedure by the investigators.

Three of the ten obstetricians practising at Westmead Hospital recommend raspberry leaf products to their private clientele, and the midwives working in the Team Midwifery Program recommend the raspberry leaf herb to their public clientele more often than the Antenatal Clinic midwives. This information would suggest that some of the women in the raspberry leaf group may have chosen their care-giver according to their more 'natural' philosophy toward the birthing process. These women may also have had a greater knowledge and/or desire for a normal or 'natural' birth outcome, therefore, choice of care-giver may have had some influence on the study results.

Despite the inconsistent consumption of this herb among the women in the treatment group the analyse suggested a shortening of the first stage of labour and reduction in spread of time in the first stage of labour. This obviously requires further investigation.

One unsubstantiated concern has been that raspberry leaf may cause preterm labour and birth. In this study only one woman in the control group birthed before 37 weeks gestation. While on average the gestation period of the two groups was quite similar, it seems that raspberry leaf may reduce the likelihood of preterm and post-term labour evidenced by the smaller spread of gestation period among the raspberry leaf group.

The analyse also suggested that women who consumed the raspberry leaf herb during their pregnancy were more likely to have an unassisted vaginal birth and less likely to require artificial rupture of membranes, forceps, ventouse extraction or caesarean section delivery. This finding may be confounded by the medical insurance status of subjects in the study and/or their choice of care-giver. This information suggests that raspberry leaf may have an effect on shortening the labour process and reduce the need for medical intervention.

The results of the qualitative data received from a majority of the treatment group indicated that the raspberry leaf herb, was perceived to shorten their labour and that they would take this herb during their next pregnancies and would also recommend it to friends and family.

The results of this retrospective observational study suggest that a full randomised controlled trial on the effect of raspberry leaf extract on pregnancy and labour should be undertaken. Such a randomised controlled trial commenced in March 1999 at Westmead Hospital

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