

Maternal Energy During Labor Intrapartum Nutrition and Nourishment: A Clinical Study

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Abstract

Objectives: This study aims to explore the relationship between maternal oral intake during labor, and the duration of labor and to examine if oral intake does affect labor and the incidence of operative and instrumental deliveries.

Materials and Methods: A clinical study was conducted on 2340 child bearing women. 390 women were allowed to oral liquids and soft diet intake and 1950 were considered as a control group and kept fasting according to the hospital routine. Type of delivery of each woman and duration of the 2nd stage of labor were recorded.

Results: There were fewer cesarean sections (7.9 %) in the oral intake group than those in the fasting group (10.5%). Of the oral intake group (2.1%) had instrumental deliveries versus 4% of the fasting group. The incidence of normal vaginal deliveries in the oral intake group was 90% while it reached 85.5% in the fasting group. Women who were allowed to oral intake had shorter 2nd stage of labor.

Conclusion: For the average women in labor, fluids and light snacks can safely be given orally.

Keywords: Maternal nutrition, Labor, Normal delivery.

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Introduction

Many articles discussed the importance of good nutrition during pregnancy, but very few discussed it during the hours of labor. What the laboring woman eats or drinks may be critical to her success in giving birth. ¹ The policy of not allowing oral food and fluids during labor began in 1940's when general anesthesia was widely used and anesthesia complications were also widely spread.

In 1946, Dr. Curtis Mendelson identified aspiration of stomach contents as the cause of post-aspiration pneumonia and of subsequent maternal mortality. Aspiration of undigested food can cause airway obstruction, but not aspiration pneumonia, and no death happened due to aspiration of fluids with a neutral pH. ² A pH of 2.5 or higher is a more difficult problem when aspiration occurs due to general anesthesia, therefore; prophylactic antacid may be administered to reduce gastric volume and decrease gastric acidity. ³

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Fasting doesn't eliminate stomach contents, and regardless of the time of the woman's last meal, the stomach will never be completely empty.^{4, 5}

It is well-known that restricting food in labor may cause problem of its own, and can be unnecessarily stressful for the laboring women. Prolonged labor often results in interventions by health care providers, including augmentation of labor and operative birth. The risk of emergency operative birth under general anesthesia then becomes higher, hence, increasing the risk for aspiration.¹ In general, the women may wish to eat and/or drink in early labor but are less likely to want to eat in late labor, or when they have received narcotic analgesia.^{6,7}

The College of Nurse-Midwives (CNM) data group (1996) described intrapartum nutrition in a large, low-risk sample of women whose labors were managed by midwives in hospitals. It represented lower incidence of episiotomies, lacerations, cesarean deliveries and instrumental deliveries in the analysis sample that were allowed for oral intake than total group who were kept fasting.⁸

This study aimed at identifying the relationship between maternal oral intake during labor and duration of labor, and also to investigate effect of oral intake on delivery method and labor outcomes.

Fasting results in maternal exhaustion and prolonged duration of labor; which leads to an increased incidence of cesarean section, instrumental delivery and increased fetal complication due to maternal complications.⁵

In Jordan, the policy in governmental hospitals does not allow oral intake or even ice chips, only sips of water in early labor. Intravenous fluids are usually used to correct dehydration and to provide energy. Provision of IV fluids exposes the mother to many complications, and provides only a small part of maternal caloric needs.

Fasting depletes the carbohydrates available, which leads to protein and fat stores metabolization in an effort to provide glucose for energy.^{2, 3} Poor physical condition, fatigue, tension, and malnutrition are all associated with increased pain perception, increased anxiety, longer labors, and more perinatal problems.² As effective pain management reduces cesarean birth rate, good nutrition will reduce perception of pain and comfort the laboring woman; decreasing the possibility of cesarean birth.⁹

One liter of 5% dextrose in water or salt solution provides only 225 calories (28-37 calories per hour compared with 50-100 calories per hour which is maternal need of caloric in active labor) which will not match maternal caloric needs.²

Methodology

A clinical research was initiated on 1st of January 2005 studying laboring women admitted to obstetric unit at Al-Mafraq Pediatric and Gynecology Hospital extended to 30th of June 2005. Simple random sampling was adopted to determine the sample by choosing women admitted in one day of the week while control group members were determined as those who were admitted in the other days of the week. The sample consisted of 2340 laboring women. Three hundred and ninety laboring women were studied compared to 1950 women who were considered as a control group. High risk deliveries were excluded from the sample. Exclusions were preterm (<37 weeks gestation) or post term (>42 weeks gestation), primigravidas, medical problems (hypertension, gestational diabetes, asthma, preeclamptic toxemia), obstetric problems (non-cephalic presentation, labor induction, history of prior cesarean section), and birth shortly after arrival to the labor unit. Women who had an elective cesarean section were also excluded. All women included in the sample had a spontaneous onset of true labor pain.

All women of the studied sample drank clear liquids during labor. They consumed soft foods (yogurt, jelly, and plain biscuits) when uterine

contractions were slight to moderate. The sample group was allowed to take oral fluids and soft diet in the latent phase of the first stage of labor, then oral intake was restricted to oral juice and water during active phase of the 1st stage of labor. The oral intake group and the control group were observed directly for comfort experience and strength during birth process, and indirectly by reviewing mother's files which represented the duration of the 1st stage (from 3cm to 10cm cervical dilatation) and of the 2nd stage of labor. Mode of delivery (normal vaginal delivery, cesarean section, or instrumental delivery) was also observed.

Results

Members of the sample (oral intake group and fasting group) aged between 18 to 35 years old, married, non-smokers, and all were Jordanians. They were healthy women at term who did not have risk factors that would preclude or limit oral nutrition in labor. Increased consumption of food was seen in women who were ambulatory during labor or who had slight contractions. The ones who were more likely to take nothing by mouth were those with strong contractions and who remained in bed during labor with oxytocin intravenous line.

Those with nausea and vomiting took nothing by mouth as well. The control group was kept fasting according to the institution policy or very minimal amount of water was permitted when necessary.

In table (1); the type of oral intake is presented according to the type of delivery (normal vaginal delivery, instrumental delivery, and cesarean section). The two categories that were used for analysis were oral intake and fasting according to the type of nutrition. There were fewer cesarean sections 7.9% (with no evidence of anesthesia complications) in all deliveries of the oral intake group than those of the control group (10.5%). Instrumental deliveries were less frequent (2.1%) in the oral intake group versus 4% in the control group. The incidence of normal deliveries in the case of the oral intake group was (90%) while it was (85.5%) in the control group.

Women who were allowed to take oral foods had shorter 2nd stage duration of labor (22 min) than those kept fasting (31 min), and they verbalized less exhaustion as reported by the midwives.

Table (1): Type of delivery in relation with the type of nutrition of the studied sample and control group.

<i>Type of delivery</i>	<i>Fasting group</i>		<i>Oral intake group</i>	
	<i>frequency</i>	<i>Percentage</i>	<i>frequency</i>	<i>percentage</i>
<i>Spontaneous*</i>	<i>1667</i>	<i>85,5%</i>	<i>351</i>	<i>90%</i>
<i>Instrumental**</i>	<i>78</i>	<i>4%</i>	<i>8</i>	<i>2,1%</i>
<i>Cesarean section***</i>	<i>205</i>	<i>10,5%</i>	<i>31</i>	<i>7,9%</i>
<i>Total</i>	<i>1950</i>	<i>100%</i>	<i>390</i>	<i>100%</i>

**national baseline of normal birth rate in Jordan 84.9/100 deliveries (10).*

***national baseline of instrumental birth rate in Jordan 1.09/100 deliveries (10).*

****national baseline of cesarean birth rate in Jordan 14.01/100 deliveries (10).*

Discussion

The physiological requirements for glucose (in response to uterine contractions) increased during active labor. ² The policy in many hospitals, when there is little risk of the woman needing general anesthesia, is to take a low-fat and low-

residue diet according to appetite, in order to provide energy and avoid hunger. ³ However; in some hospitals, women receive nothing to eat during labor and are allowed only ice chips to suck. ⁸ In Jordan, the governmental hospitals do not allow oral intake to the women in labor.

They are allowed only sips of water in the early stages labor. Intravenous fluids are usually used to correct dehydration and provide energy. Provision of IV fluids exposes the mother for many complications, and provides only a small part of maternal caloric needs. Pregnancy and labor are characterized by an exaggerated response to starvation, reflected by more rapid development of hypoglycemia and hyperketonemia.⁵

Slow progress in labor is often attributed to inefficient uterine contractions and poor maternal effort which might contribute to a longer second stage. The study by Scheepers et al. (2001) showed that a lack of caloric intake was correlated with a higher incidence of an instrumental delivery due to non-progressing second stage, even after adjusting to possible confounding factors.⁴

This study has compared intrapartum nourished and non-nourished low-risk groups of women whose labors were managed by midwives in a governmental hospital. Ingestion of foods was most common in women whose contractions were slight to moderate. Whereas, ingestion of oral liquids was during active labor and was withheld only when strong contractions were exaggerated and when emesis was most common. Many healthy laboring women choose to eat and drink in labor if they were allowed to.

There were many limitations that affected the study but not the accuracy of the results. Difficulty in accurately measuring the duration of the 1st stage was because observations started only after admission of laboring women and not from the onset of labor. Also, the data did not allow a detailed assessment of the amount and frequency of oral intake.

In the light of these results, policy review of maternal nutrition during labor in Jordanian governmental hospitals should be put in mind, in addition to the following recommendations:

- Revision of institutional guidelines to make policies be in line with maternal preferences;

and policy of withholding food and liquids from women in labor should be reconsidered.

- Developing certain guidelines and priorities to take into consideration; including: identifying risk factors, when to restrict oral intake, notification of anesthesia providers of patients at risk, and considering the appropriate antacid H2 blocker or proton pump inhibitors preoperatively.
- Risk assessment during labor process should continue as usual; the consideration of limiting oral solids and/or liquids among women with increasing risk (prolonged labor, persistent vomiting, and narcotic analgesia) might be indicated.
- Evaluating the importance of all women who are at high risk of operative birth for characteristics leading to difficult intubations or aspiration. And notifying anesthesia services of these women in a timely manner.
- Further researches should consider safety types of nutrition, evaluation of comfort and pain level, and the relationship between nutrition and the use of oxytocin during labor.

Conclusion

For the average women in labor, needed food and fluid can safely be given orally. The major benefit of this approach is that the mother becomes so much more comfortable.

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تغذية الأم في أثناء المخاض

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الملخص

الأهداف:

1. اكتشاف العلاقة بين تغذية الأم (عبر الفم) في أثناء المخاض مع طول فترة المخاض.
2. تفحص ما إذا كان تناول الغذاء يؤثر على نسبة حدوث الولادات الجراحية.

أدوات البحث وطرقه: تم تنفيذ دراسة سريرية لـ 2340 حالة ولادة في وحدة الولادة في مستشفى الأمراض النسائية والأطفال/المفرق خلال فترة 6 شهور. سمح لـ 390 أمماً (مجموعة التدخل) بتناول السوائل والعصائر والوجبات الخفيفة في أثناء المخاض، ولم يسمح لـ 1950 أمماً (المجموعة القياسية) بتناول أي غذاء، وذلك حسب السياسة المتبعة في المستشفى، وإنما انحصرت التغذية في السوائل الوريدية في حالة ظهور علامات الجفاف عند الأمهات في أثناء المخاض. تم التركيز على تدوين طول فترة المخاض في المرحلة الثانية من الولادة لكلتا المجموعتين حيث كان من الصعب تدوين مراحل الولادة كاملة بسبب اقتصار مراقبة الأمهات فقط على فترة ما بعد دخول المستشفى وليس منذ ابتداء المخاض، كما تم تدوين طبيعة الولادة لكل حالة من كلتا المجموعتين أيضاً لمعرفة كل طريقة ولادة لكل مجموعة ومقارنتها بنوع التغذية المقدمة للأم.

النتائج: كانت فترة المرحلة الثانية من الولادة الطبيعية لمجموعة التدخل (معدل 22 دقيقة) أقل من تلك الفترة للمجموعة القياسية (معدل 31 دقيقة) بما يتوافق مع ما تمت دراسته من أبحاث سابقة على موضوع الدراسة نفسه. كانت نسبة الولادات الطبيعية في مجموعة التدخل (90%) أعلى منها في المجموعة القياسية (85.5%)، بينما كانت نسبة الولادات الجراحية: العمليات القيصرية (7.9%) والولادات بالأدوات المساعدة مثل الملقط والشفط (2.1%) لمجموعة التدخل، وللمجموعة القياسية: العمليات القيصرية (10.5%) والولادات بالأدوات المساعدة (4%) أي أعلى من المجموعة الأولى مما يعرض الأمهات والمواليد لمزيد من المضاعفات الولادية.

الختام: لقد توصلنا من خلال الدراسة إلى انه يمكن للأمهات في أثناء المخاض تناول ما يُردن من السوائل والعصائر والوجبات الخفيفة وبشكل آمن لأن ذلك يفيد في حصول الأم على قدر أكبر من الراحة ومضاعفات ولادية أقل.

الكلمات الدالة: تغذية الأم، المخاض، الولادة الطبيعية.