ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/8369971

Maternal Ramadan Fasting and Neonatal Health

Article *in* Journal of Perinatology · January 2005

DOI: 10.1038/sj.jp.7211189 · Source: PubMed

CITATIONS
49

READS
169

2 authors:

Zohreh Kavehmanesh
Research Center for Gastroenterology and Liver Diseases
31 PUBLICATIONS **210** CITATIONS
SEE PROFILE

Hassan Abolghasemi
Iranian Blood Transfusion Organization
120 PUBLICATIONS **1,745** CITATIONS
SEE PROFILE

Some of the authors of this publication are also working on these related projects:

G6PD deficency and neonatal jaundice View project

All content following this page was uploaded by Hassan Abolghasemi on 29 June 2014.

The user has requested enhancement of the downloaded file.

Original Article

Maternal Ramadan Fasting and Neonatal Health

Zohreh Kavehmanesh, MD
Hassan Abolghasemi, MD

This retrospective cohort study sought to determine the effects of maternal Ramadan fasting during pregnancy on neonatal birth weight as an important aspect of fetal health. It was carried out among healthy women who were admitted for their neonate delivery at two medical centers in Tehran from January to September 2000. Neonates of 284 mothers with a history of Ramadan fasting during pregnancy were compared with neonates of 255 mothers who did not have a history of fasting during their pregnancies. On univariate analysis, neonatal birth weight of the fasted group was 100 g more than those of the nonfasted group ($p = 0.009$). However, body mass index (BMI) of the fasted mothers was greater than that of the nonfasted mothers. When controlling for maternal BMI on neonatal birth weight, multiple linear regression models showed that neonates of fasted women were 71 g heavier than those of the nonfasted group, which was not statistically significant ($p = 0.1$). We conclude that maternal fasting during Ramadan did not have a significant effect on the neonatal birth weight. Other health effects that we did not observe could have occurred.

Journal of Perinatology (2004) **24,** 748–750. doi:10.1038/sj.jp.7211189
Published online 2 September 2004

INTRODUCTION

Muslims fast from sunrise to sunset during the 9th lunar month (Ramadan). This fasting includes avoidance of drinking liquids as well. The duration of fasting is dependent on the exact time of sunrise and sunset, and varies from 13 to 18 hours per day. Although Ramadan fasting is optional during pregnancy, many pregnant Muslim women choose to fast.

The effects of maternal malnutrition and fasting on maternal metabolism have been fully discussed before.[1–10] Accelerated starvation is noticed in pregnant women compared with nonpregnant women after only 12 hours of fasting.[6] After a period of fasting for 13 hours or more, maternal corticotrophin-releasing hormone is elevated compared with those without food for periods less than 13 hours.[7] There are few studies to discuss Ramadan fasting and its effect on neonatal health.[10,11] Malhotra et al. compared metabolic changes in 11 Ramadan-fasted and 11 overnight-fasted pregnant women and none of the Ramadan-fasted mothers had a completely normal set of biochemical values at the end of the fast day. Nevertheless, they did not find any difference between pregnancy outcomes of these two small groups of mothers.[10]

We conducted this study to determine effects of maternal fasting on the neonatal birth weight.

METHODS

This historical cohort study was conducted among healthy women who gave birth at the Najmieh and Baqiyatallah hospitals in Tehran from January 1st to the end of September 2000. The sample cases were selected from a population of healthy mothers with no history of any significant illnesses or drug consumption during their pregnancies. The fasted women were those with a history of at least 10 days of Ramadan fasting, and nonfasted women had no history of fasting during their pregnancies. The fasted hours were about 13 hours per day. The mothers' data collection included their age, weight (before pregnancy and at the time of delivery), height, education, the number of fasting days, any history of smoking or significant stress, their occupation and their feeding status during pregnancy before child birth. The neonatal data including sex, birth weight and height and maturity were collected after the childbirth. These data were then analyzed by χ^2-test and multiple linear regression models (SPSS, Inc. Chicago).

All statistical tests were two-tailed and p-values <0.05 were considered statistically significant.

RESULTS

A total of 539 healthy mothers were enrolled in this study: 284 pregnant women constituted the fasted group and the nonfasted group consisted of 255 mothers. Fasted mothers had a history of 10 to 60 days of fasting (24 ± 7 days); a few had fasted beyond the Ramadan month. The mean age of mothers was 28 ± 5 years (28 years in the fasted group and 27 years in nonfasted group).

The information of maternal weight, height and body mass indexes (BMIs) of the two groups are shown in Table 1.

Maternal education (1.5% had higher university degrees, 13.9% had bachelor degrees, 46.8% had graduated from high school and the remaining 37.8% had not finished their high school) did not differ between groups. In all, 85 (15.8%) mothers had worked at an

Department of Pediatrics, Baqiyatallah Medical Sciences University, Baqiyatallah Hospital, Tehran, Iran.

Address correspondence and reprint requests to Zohreh Kavehmanesh, Department of Pediatrics, Baqiyatallah Medical Sciences University, Baqiyatallah Hospital,Tehran 14359, Iran.

© 2004 Nature Publishing Group All rights reserved. 0743-8346/04 $30

Table 1 Maternal Weight, Height and BMI of Two Groups of Fasted and Non-Fasted Mothers

	Maternal fasting group	Mean	Standard deviation	*p*-value *T*-test
Pre-pregnancy wt (kg)	Fasted	65.8	12.2	<0.001
	Nonfasted	61.5	11.2	
Delivery wt (kg)	Fasted	77.8	12.2	<0.001
	Nonfasted	74.1	11.3	
Height (cm)	Fasted	159.2	6.55	0.706
	Nonfasted	159.4	5.15	
BMI	Fasted	25.9	4.4	<0.001
	Nonfasted	24.2	3.9	

WT: weight, Ht: height, BMI: body mass index.

Table 2 Premature Births in Fasted and Non-Fasted Groups of Mothers

Maternal fasting group	Neonatal maturity		
	Term (%)	Preterm (%)	Total
Nonfasted	245 (96.1)	10 (3.9)	255
Fasted	276 (97.2)	8 (2.8)	284
Total	521 (96.7)	18 (3.3)	539

Table 3 Neonatal Birth Weight and Height in Fasted and Non-Fasted Mothers

Variable	State of maternal fasting	Mean	Standard deviation	*p*-value *T*-test
Birth weight (g)	Nonfasted	3165	440	0.009
	Fasted	3265	444	
Birth height (cm)	Nonfasted	49	1.8	1
	Fasted	49	1.9	

occupation during their pregnancies (14.1% of the fasted group and 17.6% of the nonfasted group: $p = 0.28$).

None of the mothers in either group had a history of smoking during pregnancy. The maternal feeding status and significant stress during pregnancy did not differ significantly between the two groups (*p*-values were, respectively, 0.24 and 0.94).

All the mothers delivered live births. Five mothers had twins (four in fasted and one in nonfasted group). Of these offspring, 258 (47%) were male and 286 (53%) were female.

Maturity, birth weight and height of these two groups of neonates are shown in Tables 2 and 3. Mean gestational week of offspring (38.6±1 weeks) did not differ between the groups and preterm delivery did not differ either ($p = 0.47$).

Table 4 Regression Coefficient and Standard Error of Confounding Variables on Neonatal Birth Weight of Two Groups of Fasted and Non-Fasted Neonates.

Variable		*R* coefficient(β)	SE(β)	*t*-value	*p*-value
Maternal fasting group	Non-fasted	0.00	—	—	—
	Fasted	71.7	43.4	1.65	0.1
Maternal BMI	<19.8	0.00	—	—	—
	19.8–25.9	110.6	75.2	1.47	0.14
	26–28.9	164.3	83.9	1.96	0.05
	>29	203.9	88.7	2.3	0.02
Maternal education*	UFHS	0.00	—	—	—
	FHS	76.2	44.1	1.73	0.09
	UD	111.1	63.4	1.75	0.08
Maternal age		−0.55	5.4	−0.1	0.92
Constant		2959.8	146.1	20.3	0.0001

R, regression; SE, standard error; BMI, body mass index; UFHS, unfinished high school; FHS, finished high school; UD, university degrees.

Multiple regression analysis, taking into account the maternal BMI, education and age, demonstrates that when accounting for these confounding variables, the significance of the birth weight difference observed on univariate analysis is lost (Table 4).

DISCUSSION

There were no significant differences between maturity, weight and height of these two groups of neonates. Ramadan month is a lunar month. Sometimes it occurs in the wintertime, which would result in a shorter duration of daytime hours. When it occurs in the summertime, the duration of fasting hours would be longer and the weather hotter. For this study, Ramadan occurred in the winter. It is possible that when Ramadan occurs in the summer the longer duration of fasting, and the hotter ambient temperature may have a different effect on birth weight. Another confounding factor of our study is that the fasting mothers were heavier than the nonfasting mothers. It is possible that heavier mothers felt healthier and were therefore more prone to fast during Ramadan than the slim pregnant women, who may have been more concerned about their health. Of course, this study has focused on neonatal birth weight, height and maturity as important aspects of neonatal health, but there are also other short- and long-term effects that could be further investigated.

Acknowledgements

This study was carried out with the grant of Baqiyatallah Medical Sciences University. We must thank Mr. Khalkhali for his assistance on statistical analysis and nursery and delivery sections staff of Baqiyatallah and Najmieh hospitals.

References

1. Prentice AM, Prentice A, Lamto WH, Lunn PG, Austin S. Metabolic consequences of fasting during Ramadan in pregnant and lactating women. Hum Nutr Clin Nutr 1983;37C:283–94.
2. Mustafa KY, Mahmoud NA, Gumno KA, Gader AMA. The effect of fasting in Ramadan: serum uric acid lipid concentration. Br J Nutr 1978;40:573–81.
3. Mustafa KY, Mahmoud NA, Gumno KA, Gader AMA. The effect of fasting in Ramadan: fluid and electrolyte balance. Br J Nutr 1978;40: 537–539.
4. Hallak MH, Normani MZA. Body weight loss and changes in blood lipid level in normal men on hypocaloric diets during Ramadan fasting. Am J Clin Nutr 1988;48:1197–210.
5. Husain R, Duncan MT, Cheah SH. Effects of fasting in Ramadan on tropical Asiatic Moslems. Br J Nutr 1987;58:41–8.
6. Metzger BE, Vileisis RA, Ravnikar V, Freinkel N. Accelerated starvation and the skipped breakfast in late normal pregnancy. Lancet 1982; 588–92.
7. Herrmann T, Siega-Riz AM, Hobel CJ, Aurora C, Dunkel-Schetter C. Prolonged periods without food intake during pregnancy increase risk for elevated maternal corticotropin -releasing hormone concentrations. Am J Obstet Gynecol 2001;185(2):403–12.
8. Hoskins A. Pregnancy and fasting during Ramadan. BMJ 1992;304(6836):1247.
9. Reeves J. Pregnancy and fasting during Ramadan. BMJ 1992;304(6830):843–4.
10. Malhotra A, Scott PH, Scott J, Gee H, Wharton BA. Metabolic changes in Asian Muslim pregnant mothers observing the Ramadan fast in Britain. Br J Nutr 1989;61(3):663–72.
11. Cross JH, Eminson J, Wharton BA. Ramadan and birth weight at full term in Asian Moslem pregnant women in Birmingham. Arch Dis Child 1990;65:1053–6.

View publication stats