ORIGINAL ARTICLE

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EFFECTS OF FASTING DURING THE THIRD TRIMESTER OF PREGNANCY ON NEONATAL GROWTH INDICES

Abstract

Ramadan is a fasting month for Muslims. Fasting commences from dawn until sunset and is obligatory for all healthy accountable Muslims. The sick and travelers are exempted from fasting until their travel ends or until they are healthy. Some Muslim pregnant women, who may be prone to side effects should they fast, do fast during Ramadan for up to 30 days, against the advice of their obstetrics'. In this study, we examined the effects of fasting during the third trimester on the anthropometric index of neonates.

Methods:
This study was conducted in historical cohort and the data were collected through interviews and by examining medical documents of the mothers and the babies. In this retrograde study the population consisted of 179 newborn babies.
The exposure group consisted of the mothers who were fasting and the non exposure group consisted of other mothers who were not fasting. Sixteen newborn babies who did not have the criteria for inclusion were omitted. The data were analyzed by SPSS and then a T test was done.

Results:
In this study 91.1% of the mothers were pregnant for three times and less than 57.1% of the newborn babies were males and 42.9% were females. The types of delivery of 58/1 were normal and 41/9 of them were done through cesarean. The average weight of newborn babies in exposure group was 3313+_533 gm. compared with 3346+_337 gm. in non-exposure group. The length in exposure group was 49/74+- 1/84 cm. compared with 49/9+_1/89 cm. in non-exposure one. The average size of the head circumference was 34/65+_1/57 in the exposure one, whereas; in non exposure group it was 34/57+_1/57. In all this above the observer found no significant relation. The relative-risk low birth weight (LBW) in exposure group was1.9 (0.61-5.98).

Conclusion:
The data of this study showed that fasting of pregnant mothers during their third trimester of pregnancy did not have an affect on the growth indices of their newborn babies.

Key words: Fasting, Pregnancy indices, third trimester.

Introduction:

One of the religious duties in Islam is fasting during the month of Ramadan. Ramadan is a blessed month for Muslim societies. Many fast during Ramadan in observance of this religious duty. (1) Ramadan is the fasting month for Muslims. (2) Fasting is from dawn till sunset and is obligatory for all accountable Muslims who are not exempted on grounds of health or travel. (3) The sick, travelers, and pregnant and breastfeeding women ((4) who fear for their well being or that of the foetus/child) may be exempted untilthey are again at peace or healthy. Despite of obstetrics' advice, some pregnant women who may be prone to side effects if they fast, do fast during this month because of the social norms.

Pregnant mothers experience more stress compared with non-pregnant ones and fasting may increase this stress. There is a hypothesis that fasting may cause hypoglycemia, leading to small size of gestational age (SGA) in fetus (10). Consequently, the decrease of weight at birth may increase the likelihood of birth mortality and disabilities among newborn babies. It would be interesting to evaluate the effects of fasting on newborn babies' weights. (5) One study in England, reported that fasting among 11 pregnant women in Ramadan led to metabolic changes and this showed that fasting can decrease the amounts of glucose, lactate, and insulin of blood severely. (6) On the contrary, a study in Gambia among 13300 newborn babies whose mothers were fasting showed that fasting had no effects on newborn babies' weights. Additionally, another study in Birmingham showed that the weights of 13351 newborn babies whose Asian Muslim mothers had been fasting during the first trimester, decreased about 4.5 gm, compared to babies of Asian mothers who were not Muslim and therefore, did not fast; showing that fasting of mothers during pregnancy does not in general affect the weight of their neonates. The goal of this study is to assess the effect of fasting during the third trimester on weights and other growth indices of newborn babies whose mothers fasted.

Material and Methods:

This is a historical cohort study. The statistical study consisted of pregnant mothers who were in their third trimester. Mothers were split into two groups: pregnant women who were on fast and those who were not. The mothers who were on fast were chosen as the case and the others were selected as the control group. The researchers matched the two groups then some criteria for entrance were considered (see below).

A) Criteria for Mothers:

The criteria for the mothers were: the coincidence of the month of Ramadan with the third trimester of pregnancy, the mothers' age (between 25-35), considering the result of pregnancy for only one child. Additionally, only mothers who experienced less than four pregnancies, without any (SGA) and (LGA), were included in this study. More criteria included the weights of the mothers (less than 90kg) with no smoking and alcohol addiction, no previous use of warfarin , metotroxat, cyclosporine, corticosteroid, and anti-convulsion drug consumption, lack of radiography and radiotherapy during pregnancy, no previous record of any hypertensions before or during pregnancy, and no precedent of diabetes,

anemia, proteinuria, infection, pre-eclampsia , or lack of malnutrition.

B) Criteria for Newborn Babies:
The criteria for the newborn babies were: they had no sign of the pulmonary cyanotic, chromosome disorder, sexual disorders, neural tube defects, dimorphic syndromes, (e.g. achondroplasia ,ant layer of abdomen defect) or amniotic fluid problems, and other congenital defects. Certain effective factors on weights of newborn babies such as: age, BMI, the experience of labor and pregnancy were omitted.

There were 179 newborn babies, 79 of them were the outcome of the exposure group and the others were in the non-exposure group. In the exposure group16 mothers were on fast for less than 10 days, 23 between 10 and 20 days and 40 of them were more than 20 days on fast. Since, there were 16 participants omitted, practically 63 participants remained in exposure group and 100 in the other one.

The data were gathered by direct interviews and documents of the mothers and children in the gynecology ward. Then the data were collected in by questionnaire. The researchers did not make a sample because they used census methods. After the evaluation, the data were computed and analyzed by SPSS and tests like T-test.

Results:
In this study 91.1% of the mothers were pregnant for the third time and less than 57.1% of newborn babies were males and 42.9% were females. Types of delivery of 58/1 were normal and 41/9 of them were done through cesarean. The average weights of the newborn babies were 3313+_533 gm. in exposure group compared to 3346+_337 gm. for non-exposure group. The height in exposure group was 49/74+- 1/84 cm. compared to 49/9+_1/89 cm. for non-exposure group. The average size of head circumference for the exposure group was 34/65+_1/57 compared with 34/57+_1/57 for the non-exposure group. Notably there was no sign of significant r relation. (table1).

Conclusion:
This study showed no significant difference in weight, height and head circumference of newly borns between the two groups studied. Therefore, this indicates that fasting does not have an adverse affect on the birth incidence. The result of the present study is similar to the Birmingham's study which compared the weight of 13351 newborn babies born to Asian Muslim women and Asian non-Muslim women. The Birmingham study was for births between 1964 and 1984, and the study showed that (7) fasting during the month of Ramadan does not have an adverse effect on full term weight of newborn babies. Similarly, a study in Malaysia showed that (8) the weights of newborn babies from mothers who were fasting in Ramadan compared with mothers who were not fasting, did not differ significantly. (9) In another study, Salleh *et al*, obtained the same results.

Unfortunately, the researchers were not able to find a similar study reporting height and head circumference to compare with the present study. Although certain studies reported the serious effects of malnutrition on neonate weight (10), fasting does not show such effects because it is different than malnutrition. During fasting a person's dietary intake

(food and liquid) seizes for a limited time. Fasting people have no restriction on the type of nutrition they consume when fasting ends during sunset, save types forbidden by the Islamic religion (such as in reference 12). This study shows that the weights of neonatal children, in the sample examined, decreased about 30 gm in exposure group compared with non-exposure group. In this study no change was found in height or head circumference. Consequently, fasting in the third trimester does not affect neonatal growth indices. The beneficial effects of fasting were not experimentally assessed in this study.

Table 1: Comparison of growth index in two groups.

Growth indices		Number r	mean e	Standard deviation	P value
birth weight	exposure	63	3312.9 g	533.08	0.640
	non-exposure	100	334635 g	377.21	
birth length	exposure	63	49.74cm	1.84	0.599
	non-exposure	100	49.9cm	1.89	
birth head circumference	exposure	63	34.65cm	1.57	0.707
	non-exposure	100	34.57cm	1.37	

Table 2: Relation between fasting with LBW of neonates.

	LBW	No LBW
Exposure	6	57
Non-exposure	5	95

The relative- risk LBW in exposure group was1.9 (0.61-5.98).
RR=1.9(0.61-5.98). Numbers in table refer to neonates.

References:

1- The Holly Koran, Surat Ul-Baqarah, verse 183.

2- The Holly Koran, Surat Ul-Baqarah, verse 187.

3- The Holly Koran, Surat Ul-Baqarah, verse 184.

4- الإمام ابي شجاع احمد ابن الحسين بن احمد الأصفهاني الشافعي (المتوفي سنة 593 هجرية)، متن الغاية والتقريب في الفقه الشافعي، كتاب الصوم.

5- Behrman RE.Kiligmen, Rm.Arvin, MA.Nelson: Textbook of Pediatrics. 16th ed. 2000 W. B. Saunders.

6- Azizi, F. (2002): Research in Islamic Fasting and Health . Annals of Saudi Medicine, Vol. 22, No. 3-4, Review Article.

7- Cross jh,Eminson J,wharton Ba,Sorrento(1990):Ramadan and Birth Weight at Full Term in Birmingham, Archives of Disease in Childhood. Arch Dis child. Oct; 65(10 Spec No):1053-6.

8-Hasani, S. (1989): Ramadan Fasting among Pregnant Women in Muar district, Malaysia and its association to health outcomes, Malays J Reprod Health. Jun; 7(1):69-83.

9- Nasrollahi, S, Arab M. (2001): Interrelation of Ramadan Fasting and Birth

Weight. Medical Journal of Islamic Academy of Sciences 14:3; 89-93.

10- Cunningham, G. Norman, F , Gant, Kenneth J, Leveno, et al. (2001):Williams Obstetrics and Gynecology , 21st edition, 227-251.

11- Malhotra A,Scott PH,Scott J,Gee H,Wharton Ba. (1989): Metabolic Changes in Asian Muslim Pregnant Mothers Observing the Ramadan Fast in Britain.Br J Nutr. May; 61 (3):663-72.

12- The Holly Kor'an, Surat Al-Ma'idah, verse 3.

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