

# The effect of Ramadan fasting on amniotic fluid volume

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## ABSTRACT

**Objective:** This cross-sectional study was carried out to assess the influence of Ramadan fasting on amniotic fluid volume.

**Methods:** For this purpose 2 groups of fasting (n=28) and non-fasting (n=25) pregnant women were investigated for amniotic fluid index (AFI) and deepest vertical pocket of amniotic fluid in November (Ramadan month) of 2001-2002 in Kerman Prenatal Clinics in Kerman, Iran. Mean of gestational age based on the last menstrual period and ultrasound reports were  $29.6 \pm 5.8$  week and  $29.5 \pm 4.2$  week in fasting and non-fasting groups.

**Results:** There was no significant difference between the

2 groups in age, gestational age, gravidity, parity and systolic/diastolic blood pressures. The mean deepest vertical pocket in fasting and non-fasting groups were  $65.9 \pm 12.9$  mm and  $62.7 \pm 6.5$  mm and there was no significant difference between the 2 groups in this regard. Mean AFI in fasting group ( $189.9 \pm 35.9$  mm) and in non-fasting group ( $166.8 \pm 25.3$  mm) showed a significant difference ( $p < 0.05$ ).

**Conclusion:** Based on the results of the present study fasting in Ramadan has no significant effect on the decrease of AFI, deepest vertical pocket and amniotic fluid volume.

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Fasting is one of the religious ceremonies of Islam that insures physical and psychological health of individuals. As opposed to starvation, in Islamic fasting in Ramadan the consumption of food and liquids is forbidden from the morning IZAN (call for prayer) to the evening IZAN for one month. There are some religious rules on fasting for sick persons,<sup>1</sup> but the effects of fasting on the process and outcome of pregnancy are a field that requires more studies. One of the points is the effect of fasting on the amniotic fluid volume. Oligohydramnios is one of the rare complications of pregnancy that its causing effect has not been fully known yet. It occurs mostly in post-term pregnancies, and it is rarely associated with congenital anomalies and twin pregnancies.<sup>2</sup> Based on some studies, maternal hydration causes an increase in the amniotic fluid volume while decrease in liquid intake may result in the decrease of amniotic fluid volume.<sup>2-4</sup>

Oligohydramnios causes umbilical cord compression and consequently increases the risk of fetal distress that can be resulted in meconium passage and meconium aspiration and finally an increase in fetal mortality.<sup>2</sup> Amniotic fluid index (AFI) is calculated by the sum of deepest vertical pocket in 4 uterine quadrants measured in sonography.<sup>2,5-7</sup> The assessment of the largest amniotic pocket is another sonographic technique for the estimation of amniotic fluid volume.<sup>2</sup> In the present study, the effect of fasting on AFI and deepest vertical pocket was investigated to obtain a sure result on fasting in pregnancy.

**Methods.** This study was a descriptive cross-sectional study. The understudied population was pregnant women between the 20th to 36th weeks of gestational age referring to Kerman Prenatal Clinics

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in Kerman, Iran. From this population, 53 women including 25 (47.2%) fasting women and 28 (52.8%) non-fasting women were enrolled into the study. The minimum length of fasting for enrolling into the study was 20 consecutive days and the length of fasting during each day was on 12 hours. Gestational age of subjects was estimated based on last menstrual period and ultrasound (US) report. To remove the effect of other factors causing oligohydramnios and polyhydramnios, all cases with urinary or skeletal anomalies, intrauterine growth retardation, multiple pregnancy, diaphragmatic hernia, diabetes, fetal hydrops and premature rupture of membrane were excluded from the study. Amniotic fluid index and deepest amniotic pocket were assessed by one expert sonologist. Sonographer using the same US machine at the end of fasting period. Sonologist was blind to the fasting and non-fasting subjects. Collected data were analyzed statistically by using t-test.

**Results.** A total of 53 pregnant women (25 fasting woman and 28 non-fasting women) were studied for the alterations of amniotic fluid volume in Ramadan. Mean age of fasting subjects was  $25.8 \pm 6.6$  year and that of non-fasting subjects was  $24.4 \pm 4.6$  year. Mean weight of fasting and non-fasting subjects were  $62 \pm 9.8$  kg and  $63.2 \pm 12.3$  kg. Mean of gravidity was  $2.9 \pm 1.8$  and  $3.2 \pm 1.2$  in fasting and non-fasting subjects. Mean of parity in fasting group was  $1.6 \pm 1.6$  and in non-fasting group, it was  $1.2 \pm 1$ . There was no significant difference between the 2 groups in regard to age, weight, gravidity and parity. There was also no significant difference between the 2 groups in regard to systolic blood pressure ( $107.2 \pm 8.9$  in fasting group and  $105.7 \pm 12$  in the non-fasting group) and diastolic blood pressure ( $46 \pm 7.6$  and  $63.3 \pm 7.2$  in fasting and non-fasting groups). Mean of gestational age was  $29.6 \pm 5.8$  week and  $29.5 \pm 4.2$  week in fasting and non-fasting groups that shows no significant difference. Mean of the deepest amniotic pocket was  $65.9 \pm 13.9$  mm in fasting group and  $62.8 \pm 6.5$  mm in non-fasting group. The difference between the 2 groups was not statistically significant ( $p > 0.05$ ,  $T = 1.093$ ). Mean of amniotic fluid index in fasting group ( $189 \pm 35.8$  mm) was more than that in non-fasting group ( $166.7 \pm 25.3$  mm) and this difference was significant ( $p < 0.05$ ,  $T = 2.719$ ).

**Discussion.** Fasting, preventing from the consumption of food and liquids is one of the religious practices of Islam during Ramadan.<sup>1</sup> Amniotic fluid index assessed by US techniques is the best predictor of amniotic fluid volume during the pregnancy.<sup>2,6,7</sup> In pregnant women, there are various factors affecting the amniotic fluid index. For example living in high places and drinking liquids increases amniotic fluid index<sup>2,4,8</sup> and decrease in the rate of liquids intake and consequently, dehydration causes a decrease in

amniotic fluid index. Oligohydramnios is defined as amniotic fluid index of  $\leq 5$  cm.<sup>2</sup> Oligohydramnios causes umbilical cord compression and consequently fetal distress. In severe oligohydramnios, the adhesion of amnion to fetal organs causes severe deformities including amputation. Amniotic fluid index does not change significantly with gestational age.<sup>5</sup>

In the present study, amniotic fluid index showed a significant increase in fasting women comparing to non-fasting ones, but there was no significant difference between the 2 groups in the mean of the deepest pocket. This finding can suggest that fasting has no effect on the amniotic fluid volume. Wolman et al<sup>8</sup> in their study found a significant difference in amniotic fluid index between fasting and control groups after 24 hours fasting, but this difference removed after one week. They concluded that decrease in liquid intake decreases amniotic fluid volume, which can be returned to normal rate after receiving liquids.<sup>4</sup> There are various studies suggesting that maternal hydration (oral or parenteral) increases amniotic fluid volume and amniotic fluid index of pregnant women.<sup>2-4</sup> Considering the result of the present study, it can be concluded that fasting in Ramadan has no effect on decrease of amniotic fluid volume and amniotic fluid index and this may be due to the compensatory effect of increase in liquid intake after daily fasting.

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## References

1. Azizi F. Fasting and health. *Teb O Tazkiyeh* 1993; 1: 35-44.
2. Cunningham FG, Gant NF, Leveno KJ, Gilstrap CC, Mauth JC, Wenstrom KD. Williams Obstetrics. 21th ed. USA: McGraw-Hill; 2001. p. 815-826.
3. Doi S, Osada H, Seki K, Sekiya S. Effect of maternal hydration on oligohydramnios: a comparison of three volume expansion methods. *Obstet Gynecol* 1998; 92 (4 pt 1): 525-529.
4. Hofmeyer GJ, Gulmezoglu AM. Maternal hydration for increasing amniotic fluid volume in oligohydramnios and normal amniotic fluid volume. *Cochrane Database Syst Rev* 2000; 2: CD 000134.
5. Chauhan SP, Roberts WE, Martin JN Jr, Magann EF, Morrison JC. Amniotic fluid index in normal pregnancy a longitudinal study. *J Miss State Med Assoc* 1999; 40: 43-46.
6. Williams K. Amniotic fluid assessment. *Obstet Gynecol Surg* 1993; 48: 795-800.
7. Williams K, Wittmann BK, Dansereu J. Correlation of subjective assessment of amniotic fluid with amniotic fluid index. *Eur J Obstet Gynecol Reprod Biol* 1992; 46: 1-5.
8. Wolman I, Groutz A, Gull I, Gordon D, Geva E, Lessing JB et al. Is amniotic fluid volume influenced by a 24-hour fast? *J Reprod Med* 2000; 45: 685-687.