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# The outcomes of the pregnancies of lactating women

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**Aim:** To evaluate the outcomes of pregnancies occurring during lactation.

**Materials and methods:** Sixty-one women who had interpregnancy intervals of 2 years were evaluated. Group 1 included 39 pregnancies of lactating women. Group 2 included 22 pregnancies of women who ceased lactation before conception. The groups were compared for gestational weight gain, birth weight, and obstetric complications.

**Results:** The birth weights of the subsequent pregnancies of the first group were statistically lower than the second group (3086.6 ± 379.2 versus 3386.8 ± 388.1 g, P = 0.006). There was no statistically significant difference in obstetric complications observed between the 2 groups (P = 0.073). In the first group, in the pregnancies without any complications, the mean duration of lactation during the subsequent pregnancy period was 2.1 ± 1.5 months, and it was 2.0 ± 1.2 months in pregnancies with complications (P = 0.985).

**Conclusion:** The mean birth weight of the subsequent pregnancy was lower in pregnancies observed during lactation. There was no difference in obstetric complications between the 2 groups. The duration of lactation is not a determining factor for increased complications in subsequent pregnancies.

**Key words:** Interpregnancy interval, lactation, pregnancy outcome

## 1. Introduction

Several studies have shown that women with a very short interpregnancy interval are at increased risk of adverse perinatal outcomes such as preterm birth, low birth weight, intrauterine growth retardation (IUGR), and fetal death (1–4). It is reported that interpregnancy intervals of less than 18 months are independently associated with increased risk of adverse perinatal outcomes compared with interpregnancy intervals of 18–30 months (5). This emphasizes the importance of advising women with an initial delivery to wait at least 12 months for subsequent pregnancy (6). Women with shorter interpregnancy intervals also have a higher risk of maternal mortality, hypertensive disorders of pregnancy, bleeding, and anemia (7). In spite of this fact, even pregnancies during the lactation period can be observed. The purpose of this study is to evaluate the outcomes of pregnancies occurring during the lactation period, to determine if lactation has any adverse effects on subsequent pregnancy, and to consider the value of continuing or stopping lactation during this period.

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## 2. Materials and methods

In this case-control study, 61 women who had a subsequent pregnancy within 2 years after giving birth were enrolled. The study was conducted at the Halil Şıvgın Çubuk State Hospital between June 2006 and June 2009. Informed consent was obtained from all individuals enrolled in the study. Women who were pregnant while lactating formed group 1 (n = 39), and women who were pregnant after the cessation of lactation formed group 2 (n = 22). These 2 groups were compared in terms of prepregnancy body mass index, gestational weight gain, birth weight, and obstetric complications such as missed abortion, intrauterine ex fetus, IUGR, and preterm delivery. None of the women in the first group continued lactation after 20 weeks of gestation.

The normal distribution of the quantitative data was evaluated with the Shapiro–Wilks test. For normally distributed variables, the difference between the groups was evaluated by independent samples t-test, and the correlation between 2 quantitative variables was evaluated by Pearson's correlation coefficient. In

evaluating the difference between the groups, covariance analysis was used in order to prevent the effect of the interpregnancy interval. For the variables that were not normally distributed, the difference between the groups was evaluated by the Mann–Whitney U test, and the correlation between 2 quantitative variables was evaluated by Spearman's rank correlation coefficient. The chi-square test and extension of Fisher's exact test to m × n tables were used to evaluate qualitative variables. Numerical data was presented as mean ± standard deviation. $P < 0.05$ was accepted as statistically significant. Data analysis was performed using SPSS 16.0.

## 3. Results

There was no statistically significant difference in the 2 groups in terms of age, body mass index, birth weight of the previous baby and gestational week at the time of birth of the previous and the subsequent pregnancies, gestational weight gain of the previous and subsequent pregnancies, and Apgar scores of the babies of the subsequent pregnancies (Table 1). However, there was a statistically significant difference in terms of the birth weight of the subsequent pregnancy between the groups ($P = 0.006$). The birth weight of the subsequent pregnancy of group 1 was lower than that of group 2 (3086.6 ± 379.2 g in group 1 versus 3386.8 ± 388.1 g in group 2). After an adjustment of the interpregnancy intervals in the 2 groups, this result remained unchanged. No complications were observed in 31 out of the 39 cases in group 1. There were 8 cases of complications including 3 missed abortions, 1 IUGR, 1 preterm delivery, 2 intrauterine ex fetuses, and 1 therapeutic abortion due to encephalocele in the first group. IUGR was detected in 1 out of 22 cases in the second group, and there were no other complications detected in the rest of group 2. In the first group, although the pregnancy complications such as IUGR, intrauterine ex fetus, and preterm delivery were observed to be higher than in the second group, this was not statistically significant, probably because of the limited number of the groups ($P = 0.073$) (Table 2).

There was a statistically significant difference in the mean interpregnancy interval. The mean interpregnancy interval was shorter in group 1 than group 2 (9.4 ± 4.2 months in group 1 versus 14.8 ± 4.8. months in group 2; $P = 0.001$). In the first group, the mean interpregnancy interval was 9.7 ± 5.2 months in 31 pregnancies without any complications; it was 8.1 ± 2.8 months in 8 pregnancies with some complications. The interpregnancy intervals did not statistically correlate with the pregnancy complications in the lactating women ($P = 0.594$).

The mean duration of lactation during the subsequent pregnancy period was 2.1 ± 1.4 months. In the first group, in the pregnancies without any complications, the mean duration of lactation during the subsequent pregnancy

**Table 1.** Demographical and obstetrical features of patients included in the study.

| | Group 1 (n = 39) | Group 2 (n = 22) | P-values |
|---|---|---|---|
| Age (years) | 25.3 ± 4.9 | 23.2 ± 3.3 | P = 0.08 |
| Body mass index (kg/m$^2$) | 26.4 ± 4.4 | 25.7 ± 3.7 | P = 0.49 |
| Gravidity | 2.5 ± 0.9 | 2.3 ± 0.7 | P = 0.59 |
| Parity | 1.4 ± 0.9 | 1.3 ± 0.6 | P = 0.66 |
| Abortion | 0.79 ± 0.86 | 0.05 ± 0.21 | P = 0.01 |
| Birthweight of previous pregnancy (g) | 3042.2 ± 580.3 | 3160.1 ± 579.2 | P = 0.45 |
| Gestational week at birth of previous pregnancy (weeks) | 38.6 ± 2.3 | 38.4 ± 1.9 | P = 0.67 |
| Gestational week at birth of subsequent pregnancy (weeks) | 38.1 ± 1.5 | 38.8 ± 1.1 | P = 0.43 |
| Gestational weight gain of previous pregnancy (kg) | 13.3 ± 3.9 | 11.8 ± 2.7 | P = 0.13 |
| Gestational weight gain of subsequent pregnancy (kg) | 10.6 ± 3.6 | 11.8 ± 3.0 | P = 0.17 |
| First-minute Apgar score of the babies of subsequent pregnancy | 7.03 ± 0.39 | 7.0 ± 0.44 | P = 0.79 |
| Fifth-minute Apgar score of the babies of subsequent pregnancy | 8.94 ± 0.24 | 8.91 ± 0.29 | P = 0.68 |

**Table 2.** The outcome of subsequent pregnancies.

| | Group 1 (n = 39) | Group 2 (n = 22) |
|---|---|---|
| Missed abortion | 3 (7.7%) | 0 (0%) |
| Intrauterine ex fetus | 2 (5.1%) | 0 (0%) |
| IUGR | 1 (2.6%) | 1 (4.5%) |
| Therapeutic abortion | 1 (2.6%) | 0 (0%) |
| Preterm delivery | 1 (2.6%) | 0 (0%) |
| Healthy baby | 31 (79.5%) | 21 (95.5%) |

period was 2.1 ± 1.5 months; it was 2.0 ± 1.2 months in pregnancies with some complications (P = 0.985). In the current study, it has been shown that the duration of lactation during the subsequent pregnancy period is not a determining factor in whether pregnancy of a lactating woman is associated with complications.

In the first group, 22 (56.4%) out of 39 women did not use any method of contraception, 13 used coitus interruptus (33.3%), 1 used an intrauterine device (2.6%), and 3 (7.7%) used condoms as contraceptive methods. In the second group, 13 out of 22 women (59.1%) did not use any method of contraception, while 7 (31.8%) used coitus interruptus, 1 (4.5%) used an intrauterine device, and 1 (4.5%) used condoms as contraceptive methods. There was no statistically significant difference between the groups in terms of contraceptive usage (P = 0.120).

## 4. Discussion

Many women lactate as long as possible to give their children the nutritional, immunologic, and emotional benefits of breastfeeding. When lactation overlaps a pregnancy, some women continue to breastfeed. It has been suggested that this overlap could produce suboptimal outcomes for both pregnancy and subsequent lactation, such as IUGR of the fetus, risk of depletion of the nutrient stores in the mother, alteration of the breastfeeding patterns, and a reduction of milk for the breastfed child (8). Before health professionals advise mothers to stop or continue breastfeeding when a pregnancy occurs, the effect of breastfeeding on pregnancy should be clearly understood.

Our study showed that the mean birth weight of the subsequent pregnancy was lower in women who became pregnant during lactation compared to women who became pregnant after stopping lactation. It has also been shown that the duration of lactation during a subsequent pregnancy is not a determining factor in whether the pregnancy of a lactating woman will have complications.

For the mother, a short birth interval may give insufficient time to recover from the nutritional burden of pregnancy (9). Pregnancy increases energy needs by 13%, protein needs by 54%, and vitamin and mineral needs by 0%–50% (10–13). Lactation represents a greater nutritional burden than pregnancy, increasing energy needs by 25%, protein needs by 54%, and vitamin and mineral needs by 0%–93% (14). Prolonged lactation has been associated with depletion of energy reserves (15). Lactation that overlaps with pregnancy represents a particularly large nutritional burden (16). Since lactation and pregnancy are both very energy-demanding processes, when these 2 physiological states occur simultaneously, the risk of depletion of nutrient stores in the mother or growth retardation of the fetus might increase, particularly among women with limited intake of food (8). Since the nutritional burden on the mother between pregnancies depends on the extent of breastfeeding, the interpregnancy interval is not the best measure of whether the mother has had a chance to recover from the pregnancy in terms of replenishing her nutritional status. Therefore, some studies examined the 'recuperative interval' (duration of the nonpregnant, nonlactating interval) instead. Studies do not provide clear evidence of an association between interpregnancy or the recuperative interval and maternal anthropometric status. This may be partly due to changes in the hormonal regulation of nutrient-sharing between the mother and the fetus when a mother is malnourished (17). On the other hand, van Eijsden et al. suggested that folate depletion contributes to the risk of IUGR, which is associated with short interpregnancy intervals, and so postnatal supplementation of folate may be beneficial (18). In another study, it was suggested that reduction of zinc intake during pregnancy affected food intake and fetal growth rate (19). Since children with vitamin $B_{12}$ deficiency present with severe neurological and hematological findings, nutritional supplementation of vitamin $B_{12}$ to pregnant women and infants may also prevent neurological deficits and neurodevelopmental retardation of infants (20).

Although it is not statistically significant, obstetric complications occur more frequently in the pregnancies of lactating women. Since a significant decrease in birth weight is observed in these pregnancies, we propose that the interpregnancy interval should be well organized to ensure healthier mothers and children in society. Most lactating pregnant women use lactation alone or coitus interruptus as contraceptive methods. Ovulation may be delayed for many months, but eventually it reappears in women who breastfeed, generally after the introduction of other foods to the infant's diet. These women should be better educated about contraceptive methods and they should not accept lactation or coitus interruptus as

contraceptive methods in order to have more planned pregnancies. Education about contraceptives should be a part of postpartum care. Huang et al. suggested that 86% of unintended postpartum pregnancies occurred without contraceptive usage and 88% of them resulted in induced abortion, and so education of contraception before discharge from the hospital and during the postpartum period is very important (21). Intrauterine devices, progestin-only pills, depot medroxyprogesterone acetate, and male condoms are some of the reversible modern contraceptive methods that may be used for this purpose. Tocce et al. suggested that immediate postpartum etonogestrel implant insertion significantly reduced postpartum pregnancy rates in adolescents with a good continuation rate after the birth (22). However, if a pregnancy is observed during this period, women should be informed of the risk of low birth weight and a possible adverse perinatal outcome. Since the continuation of the lactation does not deteriorate the pregnancy outcome, breastfeeding should not be immediately stopped while taking into consideration the nutritional status of the mother. Further studies are needed to validate our results and support our study.

## References


1. Smith GC, Pell JP, Dobbie R. Interpregnancy interval and risk of preterm birth and neonatal death: retrospective cohort study. BMJ 2003; 327: 313.
2. Dedecker F, Graesslin O, Ceccaldi PF, Baudelot E, Montilla F, Derniaux E et al. Short interpregnancy intervals; risk factors and pernatal outcomes. J Gynecol Obstet Biol Reprod 2006; 35: 28–34.
3. Khoshnood B, Lee KS, Wall S, Hsieh HL, Mittendorf R. Short interpregnancy intervals and the risk of adverse birth outcomes among five racial/ethnic groups in the United States. Am J Epidemiol 1998; 148: 798–805.
4. Zhu BP, Rolfs RT, Nangle BE, Horan JM. Effect of the interval between pregnancies on perinatal outcomes. N Engl J Med 1999; 340: 589–94.
5. Adam I, Ismail MH, Nasr AM, Prins MH, Smits LJ. Low birth weight, preterm birth and short interpregnancy interval in Sudan. J Matern Fetal Neonatal Med 2009; 22: 1068–71.
6. DeFranco EA, Stamilio DM, Boslaugh SE, Gross GA, Muglia LJ. A short interpregnancy interval is a risk factor for preterm birth and its recurrence. Am J Obstet Gynecol 2007; 197: 264. e1–6.
7. Zilberman B. Influence of short interpregnancy interval on pregnancy outcomes. Harefuah 2007; 146: 42–7.
8. Merchant K, Martorell R, Haas J. Maternal and fetal responses to the stresses of lactation concurrent with pregnancy and of short recuperative intervals. Am J Clin Nutr 1990; 52: 280–8.
9. King JC. The risk of maternal nutritional depletion and poor outcomes increases in early or closely spaced pregnancies. J Nutr 2003; 133: 1732S–1736S.
10. Institute of Medicine. Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D and Fluoride. National Academy Press: Washington DC; 1997.
11. Institute of Medicine. Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline. National Academy Press: Washington DC; 1998.
12. Institute of Medicine. Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. National Academy Press: Washington DC; 2000.
13. Institute of Medicine. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. National Academy Press: Washington DC; 2001.
14. Dewey KG. Impact of breastfeeding on maternal nutritional status. In: Pickering LK, Morrow AL, Ruiz-Palacios GM, Schanler RJ, editors. Protecting Infants Through Human Milk: Advancing the Scientific Evidence Base. New York: Kluwer Academic/Plenum Publishers; 2004. p.91–100.
15. Adair LS, Popkin BM. Prolonged lactation contributes to depletion of maternal energy reserves in Filipino women. J Nutr 1992; 122, 1643–55.
16. Adair SR. Biological determinants of pregnancy weight gain: a longitudinal study of Filipino women. Am J Clin Nutr 1993; 57, 365–72.
17. Dewey KG, Cohen RJ. Does birth spacing affect maternal or child nutritional status? A systemic literature review. Matern Child Nutr 2007; 3: 151–73.
18. Van Eijsden M, Smits LJ, van der Wal MF, Bonsel GJ. Association between short interpregnancy intervals and term birth weight, the role of folate depletion. Am J Clin Nutr 2008; 88: 147–53.
19. Kechrid Z, Amamra S, Bouzerna N. The effect of zinc deficiency on zinc status, carbohydrate metabolism and progesterone level in pregnant rats. Turk J Med Sci 2006; 36: 337–42.
20. Taşkesen M, Yaramış A, Katar S, Gözü Pirinççioğlu A, Söker M. Neurological presentations of nutritional vitamin B12 deficiency in 42 breastfed infants in Southeast Turkey. Turk J Med Sci 2011; 41: 1091–6.
21. Huang YM, Merkatz R, Kang JZ, Roberts K, Hu XY, Di Donato F et al. Postpartum unintended pregnancy and contraception practice among rural-to-urban migrant women in Shanghai. Contraception 2012; 86: 731–8.
22. Tocce KM, Sheeder JL, Teal SB. Rapid repeat pregnancy in adolescents: do immediate postpartum contraceptive implants make a difference? Am J Obstet Gynecol 2012; 206: 481.e1-7.