

## Effect of Breastfeeding during Pregnancy on the Occurrence of Miscarriage and Preterm Labour

Maysara M. Albadran *CABOG, FICMS, MRCOG*

Dept. of Obstetrics & Gynaecology, College of Medicine, Basrah University, Iraq

### Abstract

- Background** Many mothers breastfeed their babies while they are pregnant.
- Objective** To explore whether breastfeeding during pregnancy increases the risk of miscarriage and preterm births.
- Methods** A case-control study conducted in Al-Mawany General Hospital through a period extended from first of September 2011 till the first of September 2012. Two hundred fifteen pregnant women who breastfed during pregnancy and two hundred eighty pregnant who weren't breastfeeding during pregnancy were studied. Demographic data, frequency of miscarriage and preterm deliveries and neonatal birth weight were compared between the two groups. Chi-Square and student *t*-test were used to compare the result. Significant difference was considered when P value < 0.05.
- Result** The frequency of miscarriage among those who breastfed their babies during pregnancy were significantly lower than among those who didn't breastfed during pregnancy, this was unaffected by exclusiveness of breastfeeding, however, there was statistically insignificant difference in the frequency of preterm deliveries and in the birth weight between the two groups.
- Conclusions** Breastfeeding doesn't increase the risk of miscarriage or preterm births neither does it affect neonatal birth weight.
- Keywords** Miscarriage, breastfeeding, preterm labour, exclusive breastfeeding, non exclusive breastfeeding

### Introduction

**B**reastfeeding is the direct feeding of an infant or young child from female breasts rather than from a bottles<sup>(1)</sup> has a lot of benefits for the infant with regard to general health, growth and development. It decreases lower respiratory infections, ear infection and necrotizing enterocolitis, the incidence of sudden infant death syndrome, type I and type II diabetes mellitus, allergic disease (atopy); and possibly enhance cognitive development.

Breast milk contains secretory IgA antibodies, which decrease the incidence of gastroenteritis.

Some studies suggest that breastfeeding may decrease the risk of cardiovascular disease in later life, as indicated by lower serum cholesterol in adult women who had been breastfed as infants<sup>(2-5)</sup>.

Breastfeeding has a lot of benefits for the mother including:

- Decreases the risk of breast cancer, ovarian cancer, and endometrial cancer<sup>(6-9)</sup>.
- Lactation for at least 2 years reduces risk of coronary heart disease by 23%<sup>(10)</sup>.
- Decrease insulin requirement in diabetic mothers<sup>(11)</sup>.
- Lower risk of metabolic syndrome<sup>(12)</sup>.

- Lower risk of post-partum bleeding<sup>(13)</sup>.
- Long duration of breast feeding decrease risk of rheumatoid arthritis<sup>(14)</sup>.

The World Health Organization (WHO) recommends breastfeeding exclusively in the first six months and with complementary foods while breastfeeding continues for up to two years of age or beyond"<sup>(15)</sup>. Breastfeeding a child during pregnancy consider a type of tandem feeding for the nursing mother as, she provides nutrition for two<sup>(16)</sup>.

The question that frequently asked by the mothers: can I continue breastfeeding while I am pregnant? Does it hurt my pregnancy? Since suckling during breastfeeding induce release of oxytocin from posterior pituitary gland. Oxytocin causes contraction of myoepithelial cells around the mammary gland which enhance milk expulsion<sup>(17)</sup>. Hence; released oxytocin, theoretically, may cause uterine simulation during pregnancy increasing the risk of miscarriage and preterm labour.

Miscarriage: is the spontaneous end of a pregnancy prior to viability. By 6 weeks gestation, the rate of miscarriage is one in five pregnancy and by the second trimester the rate fallen to 1 in 40. Chromosomal abnormalities present in 50-70% of first trimester miscarriage, other causes include uterine abnormalities, genital tract infection, maternal diseases as thyroid diseases and diabetes mellitus and certain drugs<sup>(18)</sup>.

Preterm birth: is the delivery of a baby of less than 37 completed weeks gestational age<sup>(1)</sup>. The neonatal mortality or survival with handicap becomes significant in very preterm infants, those born between 28 and 32 weeks, and is most significant in extremely preterm infants, those born before 28 weeks. The incidence of preterm birth in developed world is 7-12%.

The intention of the study is to determine whether there is association between breastfeeding during pregnancy and increase in the risk of miscarriage and preterm birth.

## **Methods**

A case-control study was conducted in Al-Mawany Hospital extended through a period of one year from first of September 2011 till the first of September 2012.

A total of 215 pregnant women with history of breastfeeding during the current pregnancy were studied and compared with a control group of 280 non breastfeeding pregnant. The studied women were either in labour and were collected from labour ward or were with inevitable miscarriage and were collected from the emergency unit.

Full history was taken from each of the studied women including: age, gravidity, previous history of miscarriage or preterm delivery, their gestational age (determined by the date of last menstrual period and early ultrasound record), their past medical history.

Women at extremes of age (less than 18 and more than 35 years old); women with medical diseases as diabetes mellitus, thyroid diseases and sickle cell anaemia, those with history of recurrent miscarriage and preterm deliveries and those with multiple pregnancies were excluded from the study.

Pregnant who breastfed during pregnancy were divided according to the duration of breastfeeding into two groups: those who breastfed for the first 24 weeks of gestation and those who breastfed more than 24 weeks of gestation. The first group were further subdivided according to the type of breastfeeding: exclusive and non exclusive and the occurrence of miscarriage were recorded. Among the second group the duration of pregnancy (term or preterm) and birth weight were measured.

Discrete variables were expressed as numbers and percentages, continuous variables expressed as mean  $\pm$  standard deviation. Chi-Square test was used to test the significance of association between discrete variables, whereas student *t*-test was used to test the significance of differences between continuous variables. Statistically significance was considered when P

< 0.05. All data were analysed using Microsoft excel 2010 software.

**Results**

Age of both groups were compared there was no significant difference with  $P < 0.05$  ( $27.9 \pm 0.27$  for control,  $27.6 \pm 0.28$  for study group), gravidity and parity also were compared between both groups, the difference was statistically insignificant (gravidity  $3.5 \pm 1.7$  and parity  $2.5 \pm 1.7$  for control, for study group gravidity was  $3.3 \pm 1.6$  and parity was  $2.2 \pm 1.6$ ).

Table 1 showed the frequency of miscarriage and preterm deliveries among cases and controls interpreted as percentage, the frequency of miscarriage among those who breastfed their babies during pregnancy were significantly lower than among those who didn't breastfed during pregnancy ( $P < 0.05$ ), however, there was no statistically significant association between breastfeeding during pregnancy and preterm deliveries.

**Table 1. Frequency of miscarriage, preterm and term delivery among the studied groups**

Group	Control group		Study group		P value
	N	%	N	%	
Miscarriage	29	10.35%	11	5.12%	0.0164
Preterm	12	4.29%	13	6.05%	0.4967
Full term	239	85.36%	191	88.83%	0.3136
Total	280	100%	215	100%	0.0801
Odds ratio	1.3652	95% CI	0.797 to 2.34		0.2571

Table 2 showed the difference in the frequencies of miscarriage among those who breastfed their babies exclusively during the current pregnancies compared to those in whom the breastfeeding were nonexclusive interpreted as

percentages. There was no statistically significant association between the type of breastfeeding and the frequency of miscarriage with  $P > 0.05$ .

**Table 2. Effect of type of breastfeeding on the frequency of miscarriage in lactating women**

Group	Breastfeeding				P value
	Exclusive		Non-exclusive		
	N	%	N	%	
Miscarriage	6	8.11	5	5.34	0.7871
Total	99		116		

Table 3 compared the birth weight of neonates of mothers who were breastfeeding their previous child during pregnancy and those who

weren't breastfeeding. There was insignificant difference in the mean birth weight of the neonates between the two groups.

**Table 3. Illustrates the delivery birth weight of term neonates and breast fed mothers**

Groups	Delivery weight		P value
	N	Mean ± SE	
Control group	239	3.197 ± 0.02	0.4312
Studied group	189	3.202 ± 0.02	

## Discussion

Miscarriage and preterm deliveries are important problems of pregnancy<sup>(18,19)</sup>. In many developing countries, women get pregnant while breastfeeding their babies<sup>(20)</sup>, and they may have concerns about their safety during current pregnancies and the impact on the new baby. There was significantly lower frequency of miscarriage among those who breastfed during pregnancy compared to those who didn't.

The frequency of preterm deliveries is higher among women who breastfed during pregnancy, however, this doesn't reach statistical significance. This result is in agreement with the result of Moscona's (1993) survey and the comparative study of Madarshahian<sup>(21)</sup>.

Since breastfeeding stimulates the posterior pituitary gland to release oxytocin<sup>(22)</sup>, so theoretically it increases the risk of preterm labours and deliveries, however, clinically this is not the case. The protective mechanism against miscarriage and preterm labour can be explained by "oxytocin receptor sites" theory: the uterine cells that detect the presence of oxytocin and cause a contraction are scarce until term, increasing gradually after that<sup>(23)</sup>. Also the absence of gap junction proteins before term renders the uterus relatively insensitive to oxytocin<sup>(24)</sup>.

Other protective factor is possibly progesterone which stands between oxytocin and its receptor throughout pregnancy<sup>(25)</sup>.

There was insignificant difference in the frequency of miscarriage among exclusive and non-exclusive breast feeders. This means that the frequency of suckling in exclusive breastfeeding doesn't increase the risk of miscarriage because the uterus in early pregnancy is irresponsive to increasing release of oxytocin as mentioned above<sup>(23,24)</sup>.

There was statistically insignificant difference in neonatal birth weight among study and control groups. This is consistent with the result of Merchant *et al* study, which showed that overlapping breastfeeding and pregnancy was associated with a non-significant decrease of 57

gram in birth weight<sup>(26)</sup>; also it is consistent with the result of Madarshahian study<sup>(27)</sup>.

This can be explained by "adaptive mechanism" that the women adopt during pregnancy in which the women use energy more efficiently despite high energetic burden of reproduction, this is proposed on the basis of good reproductive outcomes despite low measured levels of intake relative to the calculated required intake<sup>(28)</sup>.

In conclusion, breastfeeding during early pregnancy doesn't increase the risk of miscarriage whether it is exclusive or non exclusive. Moreover, breastfeeding during pregnancy neither increases the risk of preterm deliveries nor affects neonatal birth weight.

## References

1. Picciano M. Nutrient composition of human milk. *Pediatr Clin North Am.* 2001; 48(1): 53-67.
2. Gartner LM, Morton J, Lawrence RA, et al. Breastfeeding and the use of human milk. *Pediatrics.* 2005; 115(2): 496-506.
3. Owen MJ, Baldwin CD, Swank PR, et al. Relation of infant feeding practices, cigarette smoke exposure, and group child care to the onset and duration of otitis media with effusion in the first two years of life. *J Pediatr.* 1993; 123(5): 702-11.
4. Dewey KG, Heinig MJ, Nommsen-Rivers LA. Differences in morbidity between breast-fed and formula-fed infants. *J Pediatr.* 1995; 126(5 Pt 1): 696-702.
5. Blaymore Bier JA, Oliver T, Ferguson A, et al. Human milk reduces outpatient upper respiratory symptoms in premature infants during their first year of life. *Perinatal J.* 2002; 22(5): 354-9.
6. Ip S, Chung M, Raman G, et al. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess.* 2007; 153: 1-186.
7. Nichols HB, Trentham-Dietz A, Sprague BL, et al. Effects of birth order and maternal age on breast cancer risk: modification by whether women had been breast-fed. *Epidemiology.* 2008; 19(3): 417-23.
8. Rosenblatt K, Thomas D. Prolonged lactation and endometrial cancer. WHO Collaborative Study of Neoplasia and Steroid Contraceptives. *Int J Epidemiol.* 1995; 24(3): 499-503.
9. Newcomb P, Trentham-Dietz A. Breastfeeding practices in relation to endometrial cancer risk, USA. *Cancer Causes Control.* 2000; 11(7): 663-7.
10. Stuebe AM, Michels KB, Willett WC, et al. Duration of lactation and incidence of myocardial infarction in middle to late adulthood. *Am J Obstet Gynecol.* 2009; 200(2):138. e1-8.

11. Rayburn W, Piehl E, Lewis E, et al. Changes in insulin therapy during pregnancy. *Am J Perinatol.* 1985; 2(4): 271-5.
12. Gunderson EP, Jacobs DR Jr, Chiang V, et al. duration of lactation and incidence of the metabolic syndrome in women of reproductive age according to gestational diabetes mellitus status: a 20-year prospective study in cardia (coronary artery risk development in young adults). *Diabetes.* 2010 Feb; 59(2): 495-504.
13. Chua S, Arulkumaran S, Lim I, et al. Influence of breastfeeding and nipple stimulation on postpartum uterine activity. *Br J Obstet Gynaecol.* 1994; 101(9): 804-5.
14. Pikwer M, Bergström U, Nilsson JA, et al. Breastfeeding, but not use of oral contraceptives, is associated with a reduced risk of rheumatoid arthritis. *Ann Rheum Dis.* 2009; 68(4): 526-30.
15. World Health Organization. (2003). Global strategy for infant and young child feeding. Geneva, Switzerland: World Health Organization and UNICEF. ISBN 92-4-156221-8. accessed on 17/12/2012 <http://whqlibdoc.who.int/publications/2003/9241562218.pdf>. Retrieved 2009-09-20
16. Flower H. *Adventures in tandem nursing: breastfeeding during pregnancy and beyond.* La Leche League International. ISBN 978-0-912500-97-3 accessed on 17/12/2012, 2003.
17. O'Donoghue K. Physiological changes in pregnancy. In: Baker PN, Kenny LC. *Obstetrics by ten teachers.* Chap. 3, 19<sup>th</sup> ed. London: Hodder Arnold; 2011. p. 32.
18. Catriona M. Spontaneous miscarriage. In: Edmonds K. Dewhurst's textbook of obstetrics and gynaecology, Chap. 6, 8<sup>th</sup> ed. UK: Wiley-Blackwell publishing; 2012. p.53.
19. Bennett P. Preterm labour. In: Edmonds K. Dewhurst's textbook of obstetrics and gynaecology, Chap. 28, 8<sup>th</sup> ed. UK: Wiley-Blackwell publishing, 2012. p. 338.
20. Marquis GS, Penny ME, Diaz JM, et al. Postpartum consequences of an overlap of breastfeeding and pregnancy: reduced breast milk intake and growth during early infancy. *Pediatrics.* 2002; 109(4): e56.
21. Moscone S, Moore M. breastfeeding during pregnancy. *J Hum Lact.* 1993; 9(2): 83-8.
22. McNeilly AS, Iain C. Release of oxytocin and prolactin in response to suckling. *BMJ*1983; 286: 257-60.
23. Fuchs AR, Fuchs F, Husslein P, et al. Oxytocin receptors in the human uterus during pregnancy and parturition. *Am J Obstet Gynecol.* 1984; 150(6): 734-41.
24. Zingg HH, Grazzini E, Breton C, et al. Genomic and non-genomic mechanisms of oxytocin receptor regulation. *Adv Exp Med Biol.* 1998; 449: 287-95.
25. Grazzini E, Guillon G, Mouillac B, et al. Inhibition of oxytocin receptor function by direct binding of progesterone. *Nature.* 1998; 392(6675): 509-12.
26. Merchant K, Martorell R, Haas J. Consequences for maternal nutrition f reproductive stress across consecutive pregnancies. *Am J Clin Nutr.* 1990; 52: 616-20.
27. Madarshahian F, Hassanabadi M. A comparative study of breastfeeding during pregnancy: impact on maternal and newborn outcomes. *J Nurs Res.* 2012; 20(1): 74-80.
28. Durnin JVGA. Energy requirements of pregnancy: an integration of the longitudinal data from the five country study. *Lancet.* 1987; 2: 1113-33.

---

E-mail: jubranhassan@gmail.com

Received 11<sup>th</sup> Feb. 2013: Accepted 29<sup>th</sup> Sep. 2013.