

Pattern of Breastfeeding in Infants Conceived by Assisted Reproductive Techniques at Royan Institute from birth to 6 months in Tehran - Iran

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Abstract

Objective: To determine the pattern of breastfeeding in infants who conceived by assisted reproductive techniques (ART).

Materials and methods: In a cross-sectional study, 312 infants were selected by the non-random consecutive method from ART infants who referred by Royan institute to Child Health Research Department. Infants were born between Septembers 2007 and September 2009 in Tehran. Infant nutrition, mother age, ART techniques, birth growth indexes, beginning time and the kind of nutrition and growth pattern until 6 months were considered.

Results: Breastfed infants were 110 (35.2%), 46 (14.7%) ones were formula fed and 156 (50%) were both. The rate of breastfeeding on the first day after birth in neonates with the low birth weight were less than normal birth weight ones. Approximately 36.8% of infants who had normal increase of weight and height till 6 months, began feeding on the first day of life. Mothers' age and ART technique did not affect the beginning time and kind of infants feeding.

Conclusion: The most important factor which affects ART infants' nutrition pattern is their birth weight. The beginning time of feeding affects their weight and length increase till 6 months. Based on reproductive techniques, breastfeeding was similar in different methods of ART.

Keywords: Assisted Reproductive Techniques, Infants, Breastfeeding, Exclusive Breastfeeding, Growth

Introduction

The need to promote and support breastfeeding is

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unquestionable for the health and development of infants. Breastfeeding provides all essential nutrients for the first 6 months of life. Breast milk contains the long chain polyunsaturated fatty acids which are especially important for the development of the brain and the nervous system. Breastfeeding is also associated with a decreased risk for many early-life diseases (1-3).

Breastfeeding reduces the incidence of various

conditions, particularly malnutrition, allergies and infections of the gastrointestinal and respiratory tracts. It is also cheap and regulates child-spacing. These advantages of breastfeeding have an enormous effect on promoting the health of newborns, infants, and children. Unfortunately, however, there are still a very large number of mothers who stop breastfeeding too early and use infant formula and other substitutes(3).

Low rates and early cessation of breastfeeding have important adverse effects on health, social and economic implications for women, children, the community and environment, and results in greater expenditure on national health care provision (1).

Both the World Health Organization and UNICEF recommended feeding for babies of 0-6 months is exclusively breast milk and starting complementary foods after the sixth month (3).

Pattern of breastfeeding varies between communities and the differences may originate from varying social and cultural factors. Iranian women like those in the other parts of the worlds involved in social activities, have become more reluctant in breastfeeding. In Iran, there are Baby Friendly Hospitals and in all obstetric wards' nurses and physicians emphasize on breastfed from the first hours after birth and encourage mothers to do so. However, the rate of breastfeeding and especially exclusive breastfeeding has decreased in recent years, unfortunately (3).

There are some studies about this pattern in Iran in normal infants but no study in infants conceived by assisted reproductive techniques (ART). There is a little description of ART techniques and ART infants. It is need to explain more about this kind of infants. Concerning the years of infertility and sensitivity of these mothers to care about their infants, the aim of this study is to determine the pattern of breastfeeding and to assess its determinants in ART infants.

Materials and methods

In a descriptive cross-sectional study, we assessed pattern of breastfeeding of 312 infants conceived by IVF (In vitro fertilization) or ICSI (Intra cytoplasmic sperm injection) method in Royan Institute who referred to Child Health Research Center of Tehran. Royan Institute is an institute in Tehran in which infertile couples from all over Iran can come to receive assisted reproductive techniques. All infants who were born by ART in this institute and were resident in Tehran referred to our center. Child Health

Research Center is a center for the assessment of growth and development of children where every family can take his infants or children for assessment there.

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving patients approved by the Research Ethics Committee of Academic Center for Education, Culture and Research (ACECR) and Royan Institute.

Samples were selected by the non-random consecutive method. All infants who were born between September 2007 and September 2009 by ART in Royan institute referred to our center. Parents who brought their infants to our center for physical examination two times till 6 months old, were asked to sign research informed consents and examined by pediatrician and nutritionist and data were recorded in related questionnaires. Their growth patterns were also recorded on national center for health statistics/World Health Organization (NCHS/ WHO) standard growth chart.

Data were gathered by interview and completing questionnaire about mother age, number of gestation, ART techniques, birth growth indexes (weight, height and head circumference), beginning time and the kind of nutrition after birth and the growth pattern by two times physical examination until 6 months old. The data were analyzed by SPSS version 16 software.

Results

Out of 312 infants conceived by ART, 158(50.6%) were boys and 154(49.4%) were girls.

The causes of infertility were paternal with 165 cases (52.9%), maternal with 58 cases (18.6%), both paternal and maternal with 33cases (10.6%) and unknown causes with 56 cases (17.9%).IVF techniques were used in 54(17.3%) and ICSI in 258(82.7%) cases.

244 (78.2%) mother were younger than 35 years old and 68(21.8%) ones were older.

79(25.3%) infants were multi fetal delivery. 42(13.4%) multi fetal delivery infants were fed both with breast milk and formula, 24(7.7%) cases were breastfeeding and 13(4.1%) cases were formula feeding.

109 (35%) neonate had birth weight less than 2500 gr, 200(64.1%) ones had 2500-4000 gr and 3 (0.9%) neonates had more than 4000gr.

The rate of cesarean section was 98% and 2% normal vaginal delivery.

Breast feeding in ART infants

110(35.2%) were breastfeeding, 46(14.7%) were formula feed and 156(50%) were both breastfeeding and formula feed. Out of 110 infants who were breastfed, 65 (20.8%) were exclusive breast fed. Exclusive breastfeeding definition is feeding infants only by their mother's milk until 6 months old for every 3 hours during days and nights.

Based on reproductive techniques 16(30%) IVF infants were breastfeeding, 9(16%) were formula feeding and 29(54%) were both breast feeding and formula feed.

75(29%) ICSI infants were breastfeeding, 28(11%) were formula feeding and 155(60%) were both breast feeding and formula feed.

253 (81.1%) infants were fed first day after birth, and others were fed later. 181(90.5%) infants who had normal birth weight and 69(63.3%) infants who had birth weight less than 2500 gr begin BF on the first day of birth.

15(4.8%) neonates with birth weight less than 2500 gr and 95(30.4%) neonates with normal birth weight (2500-4000 gr) were only breastfeeding. (Table 1)

10(3.2%) of breastfeeding neonates with birth weight less than 2500 gr and 55(17.6%) breastfeeding

neonates with normal birth weight were exclusive breastfeeding.

Pattern of weight gain and length increase of 213 infants in 6 months old were shown in Table 2. Approximately 36.8% of infants who had normal increase of weight and 29.1% of infants who had normal increase of height began feeding on the first day of life.

Discussion

According to our study the most important factor which had effect on ART infants nutrition pattern were their birth weight. Normal birth weight infants were fed with formula more than low birth weight infants. The beginning time of neonates feeding affected their weight and length gain till 6 months.

There were no any relations between the kind of feeding and exclusive breastfeeding and the growth pattern of infants until 6 months.

Since there were not many studies about ART infants' nutrition, so we compared the results with studies on normal conception infants.

Based on the Demographic Health Survey (DHS) statistics in 2000, 90% of the infants in Iran received breastfeeding. The exclusive breastfeeding rate at

Table 1: Relation between birth weight and kind of feeding on the first day

Birth weight	Kind of Feeding			Total
	Breastfeeding	Formula feeding	Breastfeeding +Formula feeding	
<2500 gr	15(4.8%)	18(5.7%)	76(24.3%)	109(35%)
2500-4000 gr	95(30.4%)	27(8.7%)	78(25%)	200 (64.1%)
>4000 gr	0	1(0.3%)	2(0.7%)	3(0.9%)
Total	110(35.2%)	46(14.7%)	156(50%)	312

Table 2: Relation between weight and height gain pattern at 6 months and breastfeeding

Beginning Time of feeding	Weight and Height Gain Model 6 months					
	< -2SD		Appropriate		>2SD	
	Weight	Height	Weight	Height	Weight	Height
First day	109(34.9%)	140(44.8%)	115(36.8%)	91(29.1%)	29(9.3%)	22(7%)
>First day	38(12.2%)	44(14.1%)	11(3.5%)	11(3.5%)	10(3.2%)	4(1.3%)
Total	147(47.1%)	184(59%)	126(40.4%)	102(32.7%)	39(12.5%)	26(8.3%)

- Appropriate = 50% weight of children in that age according NCHS/WHO standard chart.
- (\leq -2SD) or (\geq 2SD) = 2SD less or more than 50% weight of children in that age according NCHS/WHO standard chart.

Table 3: Exclusive breastfeeding rate at 6 months in different countries

Name of Country	Africa (13)	Australia (14)	Bolivia (15)	Germany (14)	Italy (16)	Pakistan (17)	Singapore (18)	Sweden (14)	UK (14)	USA (19)
Exclusive Breastfeeding	25%	46%	25%	10%	23%	16%	13%	42%	48%	13.3%

6 months was about 44% in that survey and decreased to 27% in next survey (2004) (4).

In a retrospective study which was based on data from 63,071 infants less than 24 months of age in all the 30 urban and rural provinces of Iran in 2006, at a national level, 90% and 57% of infants were breastfeeding at one and two-years of age respectively. Exclusive breastfeeding rates at 4 and 6 months of age at national level were 56.8% and 27.7% (1).

In other study in Zanjan on 650 infants younger than one year, breastfeeding was maintained at a high level, more than 92% for the first 12 months of life. The exclusive breastfeeding rate in newborn was 82%, but it sharply declined to 44% at one month after birth. Through 1–5 months, 42%–44% of the infants were exclusive breastfeeding (2).

In our study breastfeeding rate was 35.2% and exclusive breastfeeding was 20.8% at 6 months. Exclusive breastfeeding rate in different countries at 6 months has been shown in Table 3. Our ART infants had the same rate of exclusive breastfeeding in comparison to these country.

In Turkey, however, a vast majority of babies 1-5 months of age (89.4%) are given complementary foods but in one study in Ankara from 514 participated mothers, 260 (50.6%) ones fed their babies exclusively with breast milk (5). One factor that increases the likelihood of provision of complementary foods is the frequent crying of the baby.

In another study in Turkey on the first-year growth of 332 infants who had received different feeding regimens throughout the first 4 months, showed that the exclusive breastfeeding infants have a different growth pattern during the first year of life from those of partially exclusive breastfeeding or non-exclusive breastfeeding infants. Exclusive breastfeeding infants were significantly heavier in the first 2 months of life compared to partially breastfeeding or non-breastfeeding infants. Weight and length measurements of the predominantly breastfeeding infants were almost identical to those of the exclusive breastfeeding group at all ages (6).

But in the other study in Turkey, infants in the formula feeding group tended towards a lower weight during the first 3 months. During the second 3 months, weight gain observed in the formula feeding group was significantly higher than that of breastfeeding infants. In comparison with mixed fed infants, a significant progressive weight gain was detected in breastfeeding infants. The values obtained

for length increments were consistent with those for weight. No significant difference was seen between the length increments detected for breastfeeding and mixed fed infants from birth to 6 months (7).

In a cohort study on 156 Thai infants, breastfeeding and formula feeding infants had similar weight and length from birth to 6 months, thereafter, formula feeding infants had higher weight and length than breastfeeding infants in comparison with Thai growth charts(8).

In one study in Greek on IVF , ICSI and NC (natural conception) infants, breastfeeding rate of IVF infants was less than two other groups(60%,90% and 85% respectively)(9) which showed difference in our study .(IVF =30% and ICSI=29%).

In one study in Korea in natural conceptions infants, mother who delivered their babies through cesarean section were less likely than others to breastfeeding. In contrast, the women whose babies weighed 2.5 Kg or more were more likely than others to breast feeding. Women aged 35 years old or higher showed a longer breast feeding duration than the younger age groups, but its relation was not significant (10).In our study the majority of mothers had given birth by cesarean section(98%),thus the relationship between delivery method and infant feeding were not assessable.

The age of mothers in our study had no effect on pattern of feeding similar to the study by Koosha and his colleagues (2). But some studies showed that mothers older than 25 years were more likely to initiate and continue breastfeeding in comparison with those who were younger (11, 12).

Mothers' socioeconomic status and education level which affect breastfeeding rate were not compared in our study so we could not assess its effect on breastfeeding.

Conclusion

Our results about breastfeeding and exclusive breastfeeding in comparison to national data of Iran are fairly, however it is not favorable. We think specific attention of the physician and nursery given to these parents and infants and their mother conception about better care of their golden baby is the most important factor. We have to emphasize on education of family specifically mothers on the importance of breastfeeding.

We can find more comparable results by studying more infants (ART and normal conception) with attention to their monthly feeding and growth pattern

from birth to 2 years old and all mentioned factors in this article.

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References

1. Olang B, Farivar K, Heidarzadeh A, Strandvik B, Yngve A. Breastfeeding in
2. Iran: prevalence, duration and current recommendations. *Int Breastfeed J.* 2009;4:8.
3. Koosha A, Hashemifesharaki R, Mousavinasab N. Breast-feeding patterns and factors determining exclusive breast-feeding. *Singapore Med J.* 2008;49:1002-6.
4. Marandi A, Afzali HM, Hossaini AF. The reasons for early weaning among mothers in Teheran. *Bull World Health Organ.* 1993;71:561-9.
5. Veghari g, mansourian a, Abdollahi a. Breastfeeding status and some related factors in northern Iran. *Oman Medical Journal* 2011; 26:342-8.
6. . Karaçam Z. Factors affecting exclusive breastfeeding of healthy babies aged zero to four months: a community-based study of Turkish women. *J Clin Nurs* 2008; 17:341-9.
7. Gökçay G, Turan JM, Partalci A, Neyzi O. Growth of infants during the first year of life according to feeding regimen in the first 4 months. *J Trop Pediatr* 2003;49:6-12.
8. Donma MM, Donma O. Infant feeding and growth: a study on Turkish infants from birth to 6 months. *Pediatr Int* 1999; 41:542-8.
9. Tantracheewathorn S. Growth of breast-fed and formula-fed infants compared with national growth references of Thai children. *J Med Assoc Thai* 2005; 88:168-75.
10. Papaligoura Z, Panopoulou-Maratou O, Solman M, Arvaniti K, Sarafidou J.
11. Cognitive development of 12 month old Greek infants conceived after ICSI and the effects of the method on their parents. *Hum Reprod* 2004;19:1488-93.
12. Hwang WJ, Chung WJ, Kang DR, Suh MH. Factors affecting breastfeeding rate and duration. *Journal of Preventive Medicine Public Health* 2006; 39: 74-80.
13. Hruschka DJ, Sellen DW, Stein AD, Martorell R . Delayed onset of lactation and risk of ending full breastfeeding early in rural Guatemala. *J Nutr* 2003; 133:2592-9.
14. Dennis CL. Breastfeeding initiation and duration: A 1990-2000 literature review. *J Obstet Gynecol Neonatal Nurs* 2002; 31:12-32.
15. Omer-Salim A, Persson L A, Olsson P. whom can I rely on? Mothers' approaches to support for feeding: An interview study in suburban Dar es Salaam, Tanzania. *Midwifery* 2007; 23:172-83.
16. Yngve A, Sjöström M. Breastfeeding in countries of the European Union and EFTA: current and proposed recommendations, rationale, prevalence, duration and trends. *Public Health Nutr* 2001; 4:631-45.
17. Ludvigsson JF. Breastfeeding intentions, patterns, and determinants in infants visiting hospitals in La Paz, Bolivia. *BMC Pediatr* 2003; 3:5.
18. Currò V, Lanni R, Scipione F, Grimaldi V, Mastrolacovo P. Randomized controlled trial assessing the effectiveness of a booklet on the duration of breastfeeding. *Arch Dis Child* 1997; 76:500-3.
19. Afzal M, Quddusi AI, Iqbal M, Sultan M. Breast feeding patterns in a military hospital. *J Coll Physicians Surg Pak* 2006; 16:128-31.
20. Chye JK, Lim CT. Breastfeeding at 6 months and effects on infection. *Singapore Med J* 1998; 39:551-6.
21. Li R, Darling N, Maurice E, Barker L, Grummer-Strawn LM. Breastfeeding rates in the United States by characteristics of the child, mother, or family: The 2002 National Immunization Survey. *Pediatrics* 2005; 115:e31-7.