Effect of Exclusive Breastfeeding on Infants Growth and Comparison with other Types of Feeding in Sulaimani City, Kurdistan, Iraq.

Sardar M. Weli.1

*Nursing Department, Technical College of Health, Research Center, Sulaimani Polytechnic University, Sulaimani, Iraq.

Abstract

Breastfeeding (BF) serves as a complete nutritional source for the first six months of infant’s life. Breast milk contains all essential nutrients that necessary for the physiological growth and development of infants. The aim of this study was to compare the physiological growth of infants including weight, length (height) and head circumference who were exclusively breastfed for 6 months and those who were given bottle-fed or mixed fed and to find percentage of exclusive breastfeeding among mothers who contributed in this study. This study was carried out in Sulaimani city/ Kurdistan region of Iraq and the cases were enrolled between the first of June 2018 and first of October 2019. Infants’ weight, length (height) and head circumstances were measured at different age levels (At age two, six, nine and fifteen months). The results of this study found that among 198 mothers who were contributed in this study; 92 (46.5%) of mothers had EBF while 90 (45.5%) had mixed feeding and only 16 (8%) had exclusive formula feeding (EFF) in the first six months of baby’s life. Infant’s weight at age 2 months showed no differences between types of feeding. However, infants weight at ages 6 and 9 months were significantly higher in infants who breastfed compared to formula fed but no differences were found between exclusive breast feeding and mixed feeding. At age 15 months weights of babies were again no differences were found between all types of feeding. For length (height) parameter, infants who were exclusively breastfed for six months were significantly higher than those of formula fed at age 2, 6, 9 and 15 months. Regarding head circumstances no significant differences between types of feeding at age 2 months were showed. Nevertheless, at age 6 and 15 months were significantly high in infants who breastfed than formula fed. The present study concluded that infants who breast fed for first six months of life have a higher weight, height and head circumferences than infants who exclusively formula fed. The percentage of EBF among Kurdish mothers were similar with other governorates of Iraq but was low compared to the recommended rate of WHO.

Keywords: Breastfeeding, Bottle feeding, Infants’ length, Infant’s weight, Infant’s head circumference.

The exclusive breastfeeding is an ideal source of nutrition for the first six months of infant’s life. Breast milk contains all essential nutrients that necessary for the physiological growth and development of infants. The purpose of this study was to compare the physiological growth of infants including weight, length (height) and head circumference who were exclusively breastfed for 6 months and those who were given bottle-fed or mixed fed and to find percentage of exclusive breastfeeding among mothers who contributed in this study. This study was carried out in Sulaimani city/ Kurdistan region of Iraq and the cases were enrolled between the first of June 2018 and first of October 2019. Infants’ weight, length (height) and head circumstances were measured at different age levels (At age two, six, nine and fifteen months). The results of this study found that among 198 mothers who were contributed in this study; 92 (46.5%) of mothers had EBF while 90 (45.5%) had mixed feeding and only 16 (8%) had exclusive formula feeding (EFF) in the first six months of baby’s life. Infant’s weight at age 2 months showed no differences between types of feeding. However, infants weight at ages 6 and 9 months were significantly higher in infants who breastfed compared to formula fed but no differences were found between exclusive breast feeding and mixed feeding. At age 15 months weights of babies were again no differences were found between all types of feeding. For length (height) parameter, infants who were exclusively breastfed for six months were significantly higher than those of formula fed at age 2, 6, 9 and 15 months. Regarding head circumstances no significant differences between types of feeding at age 2 months were showed. Nevertheless, at age 6 and 15 months were significantly high in infants who breastfed than formula fed. The present study concluded that infants who breast fed for first six months of life have a higher weight, height and head circumferences than infants who exclusively formula fed. The percentage of EBF among Kurdish mothers were similar with other governorates of Iraq but was low compared to the recommended rate of WHO.

Keywords: Breastfeeding, Bottle feeding, Infants’ length, Infant’s weight, Infant’s head circumference.
Introduction

Exclusive breast feeding (EBF) means that the infant gets only breast milk and no other foods are given. Breastfeeding (BF) serves as a complete nutritional source for the first six months of infant’s life. Breast milk contains all essential nutrients that necessary for the physiological growth and development of infants. It is important for the growing of infant’s brain and develops cognitive function in children due to its constituents of essential fatty acids. These fatty acids are not available in other types of milk (1,2). The breast milk has more health benefits and nutritional advantageous than other type of milks. It offers children a rapid growth by development, maintenance and maturation of tissues and organs (3). Exclusive breast feeding (EBF) for at least 4 months can reduce the risk of many allergic diseases such as asthma, atopic dermatitis and suspected allergic rhinitis up to 2 years old (4). The initial milk produced by mothers called colostrum contains a large amount of immunoglobulin, this is important to protect the newborns until their immune system working suitably. Colostrum act as laxative and cover gastrointestinal tract and prevent jaundice by inhibit bilirubin build up (5). EBF or predominant BF during 6 months of life protects infants from diarrhea and acute respiratory diseases (6). In addition, breastfeeding has progressive effects on infant’s cognitive development and emotional stability and prevent infants from chronic diseases and infants were not likely to be overweight later in life. On the other hands, breast feeding has beneficial effects for mothers; it reduces their risk of chronic diseases, such as hypertension, hyperlipidemia, and type 2 diabetes and protects them against onset of breast and ovarian cancers (7,8). According to a study in America, black women have a higher rate of breast cancer than white women because they have a lower rate of breast feeding (9). This study was conducted in health units in Sulaimani city to determine the physiological growth of infants including weight, length (height) and head circumference who were exclusively breastfed for 6 months and those who were given bottle-fed or mixed fed and to find a percentage of exclusive breastfeeding among those mothers who contributed in this study.

Methods

Location and participants

This study was carried out in Sulaimani city/ Kurdistan region of Iraq. One hundred ninety eight healthy and full term infants were included in this study. The criteria for entry to this study: all babies were visiting child health care units in Sulaimani city on a regular basis for vaccinations at age two, six, nine and fifteen months. Same infants were used to measure their weight, length (height) and head circumferences at different age level. Infant’s mothers were asked about feeding their babies either exclusive breast feeding (infants get only breast milk and no other foods are given) or exclusive bottle feeding (infants receive only bottle milk and not breast milk) or mixed feeding (infants get both breast milk and bottle milk) during first 6 months of infants life.

Data collection and methods

Healthy infants were enrolled between the first of June 2018 and first of October 2019. The infants’ weight, length (height) and head circumferences were measured at different age levels (At age two, six, nine and fifteen months). Infant’s weights were measured by digital baby weighting scale. Infant’s length is measured from the top of their head to the bottom of one of their heels. It’s the same as their height, but height is measured standing up, whereas length is measured while the baby is lying down. Ruler and vernier caliper were used to measure length (height). Head circumferences were measured by using a flexible tape measure. Wrap the tape around the forehead to the widest part of the back of the head.

Data analysis

Data was entered into statistical package for social sciences “SPSS” version 26 for storage and statistical analysis. One way ANOVA was applied to test the differences, with a P value of 0.05 or less considered as significant.

Results

Among 198 mothers who were contributed in this study; 92 (46.5%) of mothers had exclusive breast feeding (EBF) while 90 (45.5%) had mixed feeding and only 16 (8%) had exclusive formula feeding (EFF) in the first six months of baby’s life, Table 1.

Table 1. Distribution of infants according to the type of feeding.

<table>
<thead>
<tr>
<th>Type of feeding</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive breast feeding (EBF)</td>
<td>92(46.5%)</td>
</tr>
<tr>
<td>Exclusive formula feeding (EFF)</td>
<td>16(8%)</td>
</tr>
<tr>
<td>Mixed feeding</td>
<td>90(45.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>198 (100%)</td>
</tr>
</tbody>
</table>

The results indicated that infant’s weight at age 2 months were significantly no differences between types of feeding. However, at ages 6 and 9 infant’s weight were significantly higher (p < 0.05) in infants who breastfed compared to formula fed but significantly no differences were found between EBF and mixed feeding. At age 15 months weights of infants were again no significant differences were found between all types of feeding, Table 2.
Table 2. Distribution of the infant’s weight according to age and type of feeding.

<table>
<thead>
<tr>
<th>Infant’s age (Months)</th>
<th>Infant’s weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exclusive breast feeding (EBF) No. 92(46.5%)</td>
</tr>
<tr>
<td>Two</td>
<td>5.642 ± 0.355 A</td>
</tr>
<tr>
<td>Six</td>
<td>8.432± 0.383 A</td>
</tr>
<tr>
<td>Nine</td>
<td>9.353 ± 0.314 A</td>
</tr>
<tr>
<td>Fifteen</td>
<td>10.634 ± 0.372 A</td>
</tr>
</tbody>
</table>

Values are presented as means ± SD

Discussion

The present study investigated the effects of different types of infants feeding (exclusive breast (EBF) feeding, mixed feeding and exclusive formula feeding (EFF)) during first six months of life on many parameters that are related to growth of infants include weight, length (height) and head circumference at two, six, nine and fifteen months age of infants in Sulaimani city. The percentage of EBF, mixed feeding and EFF among participants were 46.5%, 45.5% and 8% respectively. These percentages are approximately similar to studies done in Baghdad. They found that 48%, 41% and 11% were EBF, mixed feeding and EFF (10). In addition, a study in Misan city showed that EBF among mothers was 45.6% which was less than the recommendation of WHO (11). Nevertheless, another study in Baghdad showed that the rate of exclusive breast feeding was very high in the first few month of life (64.6%) but declined rapidly to (28.3%) at age 6 months due to milk insufficiency in mothers. Other factors such as mother’s age, job and education level played role to determine EBF among Iraq’s mothers (12). On the other hand, breast feeding were very high 77.2% and 76.2 among Syrian and Jordanian women respectively (13).
The current study established that weights of infants were significantly higher in EBF than EFF at age six and nine months but at age 15 no differences were found between EBF with EFF. This is in parallel with a study that confirmed EBF results in sufficient weight gain in infants of low birth weight (14). Another study reported that infant’s malnutrition was prevented by the role of breastfeeding and it also prevents overweight and obesity (15). This may be explained by the effects of human milk composition which contain many growth factors that contribute to infant’s health, growth and development (16). The present study found that infants who exclusively bottle fed were significantly lower weight at age six and nine months compared to EBF. This finding is consistent with a study done in Ethiopia showed that infants terminated from EBF before six months of age were more likely to get diseases such as acute respiratory diseases, fever and diarrhea which are associated with increased underweight and wasting in infants (17). However, this is inconsistency with a study done previously which suggested that bottle feeding associated with infant’s weight gain because bottle feed is more concentrated and mothers encouraged infants to finish the bottle (18). Another study in Brazil also explained that children who were bottle-fed were at high risk to be overweight and obesity at age 12-24 months (19).

The height of exclusively breast fed infants was significantly higher compared to bottle fed and mixed fed infants. This result is in agreement with a study done on Malawian infants. They confirmed that infants who were breastfed until 6 months age were longer and heavier than non-exclusively breastfed infants (20). This may be due to the rates of diarrhea, fever, respiratory and gastro intestinal infections among non-exclusively breastfed infants which is higher than EBF (6). However, this finding is disagreeing with a study in Iran and they found no significant differences between weight and height of infants who were breastfed and bottlefed between 4 and 6 months (21).

The current study found that head circumferences of exclusively breast fed infants were higher compared to exclusively bottle fed infants at age six and fifteen months. One study done in Bu-Ali Sina hospital in Iran found significant differences between infants who breastfeed with those of formula fed at 6 months of age, however they also found that no differences at age 9 and 12 months (22). In addition, other study showed that exclusive breast feeding for at least 4 months associated with increase in head circumferences and head circumferences were low in infants who were exclusively breast fed for less than 30 days (23). Additionally, a study on Turkish infants during 6 months of life showed that head circumferences were higher in breast fed infants compared to formula fed and mixed fed infants (24).

**Conclusion**

The present study concluded that infants who exclusively breast fed for first six months of life have a higher weight, length (height) and head circumferences than infants who exclusively formula fed. But no significant differences were found between exclusive breast fed and mixed fed. The percentage of EBF among Kurdish mothers were similar with other governorates of Iraq but was low compared to the recommended rate of WHO.

**Acknowledgments**

I would like to express my special thanks to staffs of Shahid Hama-Rash and Shahid Shamal health units in Sulaimani for their kind help and cooperation. I would also like to thanks Razhan, Rozhgar, Baxan and Zryan (Technical College of Health/ Sulaimani Polytechnic University students) for their help in collecting some of the data.

**References**