ORIGINAL ARTICLE

EFFECT OF BREASTFEEDING ON ANTHROPOMETRIC PARAMETERS IN POSTNATAL GROWTH OF PRE-PUBERTAL MALE CHILDREN

Abdul Ghaffar Khan, Tehseen Iqbal*, Muhammad Shahid Faruqi, Abdul Rehman Khokhar***

Department of Physiology, Multan Medical and Dental College, Multan, *Ghazi Khan Medical, DG Khan, **MBBS Medical College, Mirpur, Azad Jammu & Kashmir, Pakistan

Background: Breastfed and bottle-fed children's growth is not on the same pattern. This study was conducted to find out the effect of breast and bottle feeding on pre-pubertal children. **Methods:** This comparative study was conducted in the Department of Physiology, University of Health Sciences, Lahore. The study was conducted during the period from Oct 2013 to Apr 2015. A total number of 90 male pre-pubertal children were included in this study. Only male children were included to avoid bias of sex. Participants were selected from the school children of the locality around the University of Health Sciences (UHS) Lahore. They belonged to middle socioeconomic group. Their age range was 8–10 years, on the basis of history taken from parents of children. Participants were divided into two groups. Group-I, It included 45 male children having exclusive breastfeeding during the first year after birth. Group-II, It included 45 male children having exclusive bottle feeding during the first year after birth. **Results:** The median (Q1–Q3) weights were 27 Kg (25–29) and 25 Kg (22–29) in breastfed and bottle-fed groups respectively. The difference was considered significant with p=0.017. The median (Q1–Q3) heights were 133 Cm (130–137) and 130 Cm (122–136) in breastfed group and bottle-fed group respectively. The breastfed group children had significantly greater height (p=0.030) as compared with the bottle-fed group children. **Conclusion:** Breastfeeding has a positive effect on Height and weight of pre-pubertal children.

Keywords: Breast-feeding, Bottle-feeding, anthropometric parameters

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INTRODUCTION

Nutritional status and health of a child is assessed by development and growth of the child.[1] Studies show that breastfed and bottle-fed children's growth is not on the same pattern. Breastfed children grow in a different way than the bottle-fed children.[2] Human milk is best supportive nutrition for a growing child, because its contents are natural and not artificially synthesized.[3] Contents of human milk, necessary for growth, are not static. The human breast milk changes its composition according to the growth of children.[4] This is well known that human breast milk provides growth components.[5] Useful bacteria present in human milk produce acid, which has health promoting effects by suppressing the growth of pathogens.[6]

Importance of breastfeeding lies in the fact that it covers deficiency in growth[7] and this fact was proved by WHO Meta-analysis.[8] Breastfeeding leads to appropriate growth (not stunting, not overweight).[9] Breastfeeding beyond two years has no beneficial effect on growth of children.[10] Breastfeeding for longer than four months has a positive effect on a child's mental development[11] and breastfed infants show better cognitive and neurological development than formula-fed (bottle-fed) infants.[12]

In Boyd-Orr cohort study[13] on 2,995 adults born in UK, it was found that people who received breastfeeding were taller. Effect was more on leg length. In addition breastfeeding is strongly associated with better height and weight.[2]

SUBJECTS AND METHODS

This comparative, cross-sectional study was conducted in the Department of Physiology, University of Health Sciences Lahore from Oct 2013 to Apr 2015.

A total of 90 male pre-pubertal children were included in this study. Participants were selected from the school children of the locality around the University of Health Sciences (UHS) Lahore. They belonged to middle socioeconomic class. Their age range was 8–10 years. On the basis of history taken from the parents of children, participants were divided into two groups. Group-I comprised of 45 male children having exclusive breastfeeding during the first year after birth and Group-II included 45 male children having history of exclusive bottle-feeding during the first year after birth.

Normal healthy male children of 8–10 years age who were exclusive breastfed or bottle-fed during first year of life were included in the study. Children with history of chronic disease, bone fracture, muscle weakness, retarded growth, or hospitalization due to illness and children having mixed breastfeeding and bottle feeding during first year were excluded.

After full explanation of the procedure, written permission was obtained from the Executive District Officer (Education), Headmistress of the schools, and

the parents/guardians of the children to collect data from school children. Students' height and weight were measured in standing position without shoes and heavy clothes with the help of a portable stadiometer with a balance. Height was measured in centimetre and weight was measured in kilogram. Children's height and weight were recorded on specially designed proformas. The data were entered and analysed using PASW-18. Mean±SD were calculated for quantitative variables (weight and height). Student's *t*-test was applied to find out the statistical differences between bottle-fed and breastfed groups, and $p<0.05$ was considered statistically significant.

RESULTS

Table-1 shows the comparison of weight and height between the two groups. When weights between the two groups were compared, the median (Q1–Q3) weights were 27.31±4.32 Kg (Range: 25–29 Kg) in breastfed children and 25.29±4.63 Kg (Range: 22–29 Kg) in bottle-fed children respectively. The breastfed children had significantly greater weight ($p=0.017$) as compared with the bottle-fed children.

When heights between the two groups were compared, the median (Q1–Q3) heights were 133±7 Cm (Range: 130–137 Cm) in breastfed children and 129±8 Cm (Range: 122–136 Cm) in bottle-fed children respectively. The breastfed children had significantly greater height ($p=0.030$) as compared with the bottle-fed children.

Table-1: Weight and height in breastfed and bottle-fed children

Group	Weight (Kg)	Height (Cm)
Breast-fed (n=45)	27.31±4.32	133±7
Bottle-fed (n=45)	25.29±4.63	129±8
p	0.017*	0.030*

Values are presented as Mean±SD, *Significant

DISCUSSION

Several studies published in the specialized literature have shown a positive association between the duration of the breast-feeding period and infant growth. Kramer MS and Kakuma R[12] reported that infants who are exclusively breastfed for a longer period of time can experience accelerated gain in weight and height during the first months of life, showing no growth deficit at one year of age, or even growing more than infants fed artificial milk during adolescence.

Kramer *et al*[14] reported a cluster randomized trial on 17,046 children in Belarus. They found that breastfed children were taller and heavier. Length and weight increase as length of breastfeeding is increased. To find out growth pattern among breastfed, bottle-fed and mix-fed children, Emamghorashi and Heydari[7] found that breastfed children were having greater length and weight than bottle-fed children.

To investigate mode of growth in children who were on breastfeeding, Otaigbe *et al*[15] conducted a prospective longitudinal study in 2008 by measuring weight and length. They found that breastfed children attained greater weight and length. Liu *et al*[13] conducted a study to assess and see the effect of different types of feeding and their effect on child growth.

They found that breastfed infants achieved greater weight and length as compared to bottle-fed children. To study different growth rates between breastfed and bottle-fed children, Patsourou *et al*[16] did a study on 206 children from birth up to 36 months in Greece, and found out that breastfed children acquired more length and weight. Ricco *et al*[17] reported that breastfed infants attained greater weight and height. Our findings in this study are in conformation with the previous similar work done.

CONCLUSION

Breastfeeding has a positive effect on height and weight gain of pre-pubertal children.

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Address for Correspondence:

Dr Abdul Ghaffar Khan, Assistant Professor Physiology, Multan Medical and Dental College, Southern Bypass, Multan, Pakistan. **Cell:** +92-300-7359009
Email: abdulghaffar62@gmail.com

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