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Relationship between breast feeding duration and risk of overweight/obesity among Egyptian children

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ABSTRACT

Background and aim: Breast feeding (BF); as risk factor for/or protective against childhood overweight/obesity; remains matter of debate. This study assesses relationship between BF duration, and development of overweight/obesity among Egyptian children, with respect for wide range of potentially confounding variables.

Subjects and methods: Cross sectional-retrospective study included 154 children of both sexes; aged 6–18 years. Data was collected about child birth weight, breast feeding duration, and start of weaning, family size, parental ages, education, occupation and place of residence. Anthropometric measurements and body composition were conducted. Children were classified into 3 age groups (6–9, 9.1–12 and 12.1–18 years) and 4 groups according to BF duration (Never BF, BF for 6, 7–12, and more than 12 months).

Results: Children who never BF were12.8%, while those BF for more than 12 months were 59.7%. Start of weaning was more common at 5–6 months of age (58.4%). Overweight/Obesity was detected among 30.5% of children. It was more prominent among children who BF for more than 12 months in ages 6–12 years (64.3% and 71.4%), while in those aged 12–18 years it was equivalent in those never BF (33.3%) and who BF for more than 12 months (38.9%). BF duration had insignificant correlations with parental education or occupation, or with any of the child's anthropometric measurements.

Conclusion: Childhood overweight/obesity were less prominent among children who Bf for <12 months; However, there was no effect of breast feeding duration on any of the child anthropometric measures.

Introduction

Obesity and attendant co-morbidities are an emergent problem in public health. Much attention has focused on prevention, especially during the perinatal period. In Egypt, the percentage of overweight children aged 5–19 years old, was 35% in males and 36.4% in females, while that of obesity was 10.5% and 9.5% respectively according to the EDHS 2014.[1]

El-Shafie et al.[2]; found that in children aged 6–12 years, the percentage of overweight was 16.8%, while that of obese was 9%, which was higher than that reported previously in 2011 (11.5 and 8.8%, respectively).

Breastfed infants are less likely to become overweight or obese than formula-fed babies.[3] Researchers postulate that breastfeeding promotes healthier feeding pattern because it allows infants to control intake until satiety is reached.[4,5] In contrast, formula fed infants are more prone to overfeeding because mothers may encourage infants to empty their bottles.[5] In Latino infants, low exclusive breastfeeding rates maycontribute to unhealthy feeding practices such as overfeeding resulting in an increased risk for obesity.[6]

Breastfeeding was considered a possible protective factor for obesity in childhood.[7] The WHO and United States Department of Health and Human Services[8] and Dattilo et al.[9]; reported that breastfeeding; during the first year of life particularly for at least 6 months; appears to be associated with decreased risk of obesity development in childhood and later life. Furthermore, duration of breastfeeding reduced likelihood of hypercholesterolemia, hypertension and type 2 diabetes in later life.[10] A shorter duration of breastfeeding is probably associated with precocious introduction of solid food[11]; containing more protein than breast milk; and reduced appetite signaling which in turns induces a greater

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number of feeding times.[12] However, the presence of confounding factors can hide and/or change the critical role of breast feeding.[13]

So, the aim of this study was to assess the relationship between breast feeding duration, timing of solid food introduction, and development of overweight/obesity among Egyptian children, with respect for a wide range of potentially confounding variables.

Subjects and methods

Sample

This study was a cross sectional-retrospective one. It included 154 children of both sexes (77 males and 77 females); aged 6–18 years; with their mothers, who were working at the National Research Centre. They were chosen randomly from all categories of the workers to participate in the study. They were informed about the purpose of the study and their permission in the form of written informed consent was obtained. This work was derived from a cross-sectional survey through a project funded by National Research Centre (NRC) Egypt, 2013–2016 entitled " Familiar Overweight and Obesity in Children and Adolescents: Diagnostic Clinical, Behavioral, Genetic and Biochemical Markers and Intervention" (10th Research Plan of the NRC), after taking approval from Ethical Committee of NRC (Registration Number is 13/168).

Methods

Detailed questionnaire about the breast feeding duration of the child, timing of solid food introduction and socio-demographic characteristics of his/her parents were collected from the mothers. Anthropometric measurements and body composition of the children were evaluated.

Detailed questionnaire

Breast feeding

Data was collected by well-trained doctors about the child age in years; his/her birth weight in kg., breast feeding duration (in months) and timing of solid food introduction (start of weaning). Children was classified according to their ages into 3 groups: 6–9 years (60 child: 34 males and 26 females), 9.1–12 years (41 child: 23 males and 18 females), and 12.1 up to 18 years (53child: 20 males and 33 females). According to breast feeding duration, they were grouped into 4 groups: those who never breast fed (BF), BF for 6 months or less, BF for 7–12 month, and those who BF for more than 12 months. They were also grouped according to time of start of weaning into 3 groups: those who start weaning at 4 months of age or less, at 5–6 months of age, and more than 6 months of age.

Socio-demographic characteristics

Questionnaire was directed to the mothers about place of residence (122 Urban/32 Rural), family size (No. of persons in the family, range = 2–8 persons), parental (mothers and fathers) age, education and occupation. Parental education was classified into 3 grades: illiterate, precollege and college. Maternal occupation was graded as house wives or working mothers, while father's occupation was graded as manual and non-manual workers.

Anthropometric measurements

Anthropometric measurements; including weight, height, body mass index (BMI), waist and hip circumferences, skin fold thicknesses at 5 sites: triceps, biceps, sub scapular, suprailiac and abdominal, and body composition : fat%, fat mass and fat free mass; of the children were performed following the recommendations of the International Biological Program.[14] Three consecutive measurements were taken and the mean was recorded. The instruments were recalibrated after each measurement.

Body weight was measured using Seca Scale Balance (Seca Balance Beam Scale Model 700, Seca Deutschland Medical Scales and Measuring Systems, seca gmbh & co. kg., Hamburg, Germany) with accuracy up to nearest 10 g. The subjects were asked to remove their footwear and wear minimal clothes before weighing them. *Standing body height* was measured, to the nearest 0.1 cm by using Holtain Stadiometer (The Harpenden Portable Stadiometer, Wales, UK) with the shoulder in a relaxed position and arms hanging freely and without shoes. *Waist circumference* was measured at the level of the umbilicus with the subject standing and breathing normally, *hip circumference* at the level of the iliac crest. All circumferences were taken with the subjects standing upright, with the face directed forward and shoulders relaxed, using non-stretchable plastic tape to the nearest 0.1 cm. *The skin fold thicknesses* were measured using Holtain skin fold caliper, and approximated to the nearest 0.1 mm.

Body Mass Index (BMI) was calculated as body weight in kilograms/height in metere^2. Children BMI percentile was calculated specific for age and sex based on the Egyptian Growth Reference Charts.[15] Child with BMI between 15th and 85th percentile was considered healthy weight, with BMI between 85th and95th percentile overweight and those with BMI $\geq$ 95th percentile obese.

Body composition

Each participant was also examined by the TANITA Body Composition Analyzer. As specified by the manufacturer, the unit was calibrated before testing. The participant stood on the foot board of the device, while he/her was holding the 2 handles carefully; each by one hand at the same time. By using his/her sex, age, weight and height approximated to the nearest unit, the percentage body fat (Fat %: an estimate of the fraction of the total body mass that is adipose tissue), fat mass (FM: an estimate of the fraction of the total body weight that is adipose tissue) and fat free mass (FFM: an estimate of the fraction of the total body weight that is not adipose tissue) were derived.

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS/Windows Version 16, SPSS Inc., Chicago, IL, USA). Statistical significance was set at $P < 0.05$. The Kolmogorov-Smirnov test was used to determine the normality of the data, and revealed that most of it was not normally distributed.

Parametric data were expressed as mean ± SD, while the non-parametric data (qualitative) were expressed as frequency distribution: numbers and percentage of the total. Comparisons between the different non-parametric variables were analyzed using Chi- square test. Spearman's correlation test was used to examine the association between breast feeding duration with the different variables under study.

Results

The proportion of the children who were breast fed (BF) for variable duration during infancy were presented in Table 1.Those who were never B F were 12.8% only, while the majority (77.8%) were BF for more than 6 months. The highest % of the children were Bf for more than 12 months (about 60%), followed by those BF for 7–12 months (18%). The practice of the start of solid food introduction (weaning) was common after 4 months of age (73.2%). In spite of the instructions of WHO to start weaning after