Complementary feeding of infants in their first year of life: focus on the main pureed baby foods

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Summary

Objective: to evaluate the complementary feeding practices for infants, focusing on the main pureed baby foods, and verify adherence to the guidelines adopted in Brazil.

Methods: through cross-sectional study, aspects of complementary feeding of 404 healthy infants between 4 and 9 months of age (São Paulo, Curitiba and Recife) were evaluated. Socio-demographic data, history and food habits were collected. Mothers described three recipes (preparations) usually used in key baby foods. The findings were compared with those recommended by the Brazilian Society of Pediatrics.

Results: the average age was 6.9±1.6 months. Among infants, 241/404 (59.6%) were still breastfeeding. Among those who received another type of milk, 193/368 (52.4%) received whole cow’s milk, while 151/368 (41.0%) drank infant or follow-on formulas. Regarding baby food recipes salted reported by mothers, it was seen that 30% and 60% contained meat and vegetables, respectively. The percentages less suitable for feeding in general were observed for use of cow’s milk and added sugar, chocolate and cereal in feeding bottles; 79% and 80.5% of the families interviewed would adopt such practices.

Conclusion: the early termination of exclusive/predominant breastfeeding and the practice of an inadequate transition diet have shown a picture of quantitatively and qualitatively inadequate feeding, with the risk of causing serious nutritional problems in later ages, such as anemia and vitamin A deficiency, or excess of nutrients, leading to obesity, diabetes and dyslipidemias.

Uniterms: feeding, infant, nutrition for at-risk groups, child nutrition disorders.

INTRODUCTION

The introduction of new foods in the diet of a child after six months of age should complement the several qualities and functions of breast milk, which should preferably be continued until the age of two years or older. The introduction of complementary feeding (AC) must not only meet the nutritional needs of the child, but also gradually expose the family’s eating habits, which requires adaptation to a new stage of the life cycle so that new flavors, colors, aromas and textures are presented.1 Complementary foods, when prepared specifically for the child, are called transitional.2

Countless scientific evidence indicates the importance of healthy nutrition in early life for the proper growth and development of children and the prevention of future chronic diseases into adulthood, a phenomenon known as metabolic programming.3,4

Thus, the responsibility of healthcare professionals in providing appropriate nutritional guidelines for moth-
ers and caregivers of infants is increasing. In line with this finding, the Brazilian Society of Pediatrics issued manuals targeted to pediatricians to standardize infant feeding and the Ministry of Health implemented the National Strategy for Healthy Complementary Feeding (ENPACS), which seeks to strengthen efforts to support and promote complementary feeding in the Brazilian Unified Health System - SUS.

Previous publications of the Ministry of Health and our group emphasize the high frequency of inadequate FC in the first year of a child’s life. The works emphasize the early introduction of inappropriate foods, such as whole cow’s milk; inappropriate and low density consistency and bioavailability of micronutrients (e.g., dilute soups), insufficient fruit and vegetable supply; contamination during preparation and storage; simple carbohydrates added to the bottles, and the offering of processed foods rich in simple carbohydrates, lipids and salt consumed often by family.

There are no studies available in our area assessing the suitability of transition foods in the face of the guidelines proposed by the Brazilian Society of Pediatrics.

The present study aims at evaluating the practices related to complementary feeding of infants aged 4-9 months, focusing on the main pureed baby foods, and verifying compliance with the recommendations currently adopted in Brazil.

**Methods**

Through cross-sectional study, aspects related to complementary feeding of 404 infants between 4 and 9 months of age were evaluated. The subsample was selected from a survey conducted in 2010 with 1,800 mothers of children between 4-36 months of age, socioeconomic classes A, B, C and D, in the cities of São Paulo, Curitiba and Recife. This initial sample was non-probabilistic, intentional by quotas, and weighted according to the Brazilian Census Bureau (IBGE).

Healthy infants who were not exclusively breastfed, not in school or daycare, and whose mothers were responsible for the preparation of their food and agreed to participate were included in the study (Figure 1).

Using structured and pre-coded questionnaires, data related to demographics, history and food practices were collected by previously trained professionals. Mothers were asked to describe in detail the ingredients used to prepare the fruit purees and main baby foods. Each mother reported three preparations (recipe 1, recipe 2 and 3 recipe). The preparations were evaluated in terms of food groups chosen by the mothers for the baby food recipes (cereals and tubers, legumes, meats and vegetables) according to the guidelines of the Brazilian Society of Pediatrics.

To assess the adequacy of aspects related to complementary feeding, a score was developed based on the guidelines of the SBP. The six items considered appropriate in the score were: 1) to continue breastfeeding; 2) not to offer whole cow’s milk; 3) not to add cereals, chocolate or sugar to the bottles; 4) to offer natural fruit juice respecting the maximum daily volume of 100 mL; 5) to offer fruits mashed, scraped or natural without adding sugar; and 6) refer the use, at least in one of the main recipes of baby food, of all the nutritional food groups (cereals or tubers, legume, meat or egg and vegetables) recommended by the SBP. Each item considered appropriate was assigned 1 point (range 0 to 6).

The data were entered into an Excel spreadsheet (Microsoft Office), validated, consolidated and subsequently analyzed using SPSS 20.0 Statistical Package. For statistical analysis, we used frequency tables with absolute numbers and percentages. Categorical variables were presented as absolute value and percentage, parametric continuous variables were presented as mean (standard deviation) and non-parametric as median (minimum and maximum). Chi-square test was used to compare categorical variables. The level of significance was set at 5%.

**Results**

The general characteristics of the 404 infants are shown in Table 1. The average age was 6.9±1.6 months and male gender predominated, 221/404 (54.7%). In most families, the child being evaluated was the first child, 214/404 (52.9%), and the predominant social class was categorized as C1, 190/404 (47.0%). The mean duration of exclusive breastfeeding was 3.4±1.7 months.
Among infants, 241/404 (59.6%) were still being breastfed, and the average number of feedings per day was 5.0±2.5 times. Only 36/241 (14.9%) of infants were exclusively breastfed.

Among those who received another type of milk, in addition to being breastfed, 193/368 (52.4%) received whole cow’s milk, while 151/368 (41.0%) drank infant or follow-on formulas.

Regarding the salted baby food recipes reported by mothers, 30% and 60%, respectively, contained meat and vegetables (Figure 2).

There was no statistically significant difference in the duration of breastfeeding or groups of foods used to prepare the babies’ food in terms of socioeconomic level and city studied (data not shown).

Table 2 shows the percentage of adequacy of the six topics to assess complementary feeding of infants. The mean score in the population assessed was 2.0±1.2 and the worst percentages of adequacy were observed for use of cow’s milk and additions (in bottles); only 79 (19.5%) of the mothers interviewed did not adopt these practices (Table 2).

### DISCUSSION

This study highlights some characteristics in complementary feeding of infants aged 4-9 months and not exclusively breastfed in relation to the guidelines issued by the Brazilian Society of Pediatrics.

The period of introduction of complementary foods is highly risky for the child and the offering of unhealthy food items, combined with potential contamination while the food is being handled or prepared, favors the occurrence of diseases such as obesity, diarrhea and malnutrition. Nutritional quality is another risk, emphasizing the greater need for micronutrients. With the rapid growth seen in the first year of life, iron and zinc requirements increase beyond the contents of breast milk. About 50 to
70% of zinc, and 70 to 80% of iron, should come from additional sources through food. The Department of Nutrition at the Brazilian Society of Pediatrics recommends that the main baby food offered from the sixth month of life be composed of at least one of the following food groups: cereals and tubers, legumes, meat or egg and vegetables (beans and greens).

In our study we found adequacy of 70%, 30%, 60% and 70% in the main recipes of baby food for the groups of cereals and tubers, legumes, meat and vegetables, respectively. Difficulties with appropriate complementary feeding practices have been described in studies in our midst and in developed countries, such as the US. In order to meet the nutritional needs of the infant, it is important to diversify the composition of the major food groups, aiming at the concept proposed by the SBP of multiple combinations.

Systematic reviews highlight the importance of interventions for nutritional education focusing on complementary feeding of infants in the first year of life. A recent study was conducted with 500 mothers of infants less than one year old in the city of São Leopoldo, state of Rio Grande do Sul, Brazil, randomly assigned to two groups: intervention (10 home visits targeting nutrition education based on guidelines of the Ministry of Health - “Ten Steps to healthy eating for infants aged zero to two years”) and control. Nutritional intervention for mothers of infants reduced the consumption of foods with high energy and was associated with a best suited lipid profile at eight years of age.

The mean duration of exclusive breastfeeding in this study was 3.4 months. Exclusive breastfeeding in the first six months of life is associated with a lower risk of allergic disease and sudden infant death syndrome. Furthermore, it seems to accelerate neurocognitive development and protect against chronic diseases such as type 1 diabetes, lymphoma and Crohn’s disease. Moorcroft et al., in a systematic review involving 24 studies, reported an association between early introduction of new foods and future development of obesity. Another important aspect concerns the eating behavior of children receiving milk or formula in bottles compared to breastfed children. Recent study showed that bottle feeding for infants was associated with greater weight gain regardless of the type of food (breast milk or formula).

Fifty-two percent of infants evaluated under the age of nine months received whole cow’s milk. The early use of whole cow’s milk is associated with disease development in the short and long term, among which stand out the iron deficiency anemia and future risk of obesity. The protein supply of cow’s milk is superior to that of human milk (1.2 g/100 kcal). Observational studies show an association between a protein intake above 14% of total energy consumption and future development of obesity. Excessive consumption of protein, especially from milk, stimulates the synthesis of growth factors such as insulin and IGF1, stimulating the differentiation of preadipocytes into adipocytes.

Another mistake often observed in the studied sample was adding cereal, chocolate and sugar to infant formulas, which should not receive additions. Unfortunately, this practice is very common in our country. The carbohydrate content of human milk at all stages of lactation, as well as its functional aspects, is lower than that in formulas (usually 7.6 g/100 mL). Unnecessary addition of carbohydrates to complementary feeding, in addition to increasing the energy value of foods offered to infants, unfavorably influences the child’s future preferences and eating habits and therefore should be discouraged.

Only 32% of children consumed natural fruit with no addition of carbohydrates. Early and frequent exposure to fruits and vegetables increases its consumption in later life. Similarly to what was observed with infant formulas, often there was the addition of carbohydrates to fruits.

The present study has some limitations such as the mothers’ recall bias regarding recipes used to prepare the babies’ food, and the study’s cross-sectional model.

The early termination of exclusive/predominant breastfeeding and the practice of an inadequate transition diet have shown a picture of quantitatively and qualitatively inadequate feeding, with the risk of causing serious nutritional problems in later ages, such as anemia and vitamin A deficiency, or excess of nutrients, leading to obesity, diabetes and dyslipidemias. Growing evidence of the impact of food in early life and the future development of diseases represent a window of opportunity for prevention strategies in the context of public health. Thus, strategies to promote breastfeeding and practices of healthy complementary feeding are essential to ensure the individual’s health in the short and long term.

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Resumo

Alimentação complementar de lactentes no primeiro ano de vida: ênfase nas papas principais

Objetivo: avaliar as práticas relacionadas à alimentação complementar de lactentes, com ênfase nas papas prin-
cipais, e verificar a concordância com as recomendações atualmente adotadas no Brasil.

Métodos: por meio de estudo transversal, foram avaliados os aspectos da alimentação complementar de 404 lactentes saudáveis entre 4 e 9 meses de vida (São Paulo, Recife e Curitiba). Coletaram-se dados sociodemográficos de antecedentes e hábitos alimentares. As mães descreveram três receitas (preparações) que costumam utilizar nas papas principais. Os achados foram comparados ao preconizado pela Sociedade Brasileira de Pediatria.

Resultados: a média de idade foi de 6,9±1,6 meses. Cerca de 241 lactentes (59,6%) permaneciam em aleitamento materno. Entre os que recebiam outro tipo de leite, 193 dos 368 (52,4%) recebiam leite de vaca integral, e 151 dos 368 (41%), fórmulas infantis ou de seguimento para lactentes. Em relação às receitas de papas salgadas relatadas pelas mães, foi possível observar que 30 e 60% delas continham leguminosas e carnes, respectivamente. Os piores percentuais de adequação na alimentação, em geral, foram observados para uso de leite de vaca e adição de açúcar, achocolatado e cereais em mamadeiras; 79 e 80,5% das famílias entrevistadas adotavam essas práticas.

Conclusão: o abandono precoce do aleitamento materno exclusivo/predominante e a prática de uma dieta de transição inadequada têm mostrado um quadro de consumo quantitativa e qualitativamente inapropriado, com riscos de acarretar graves problemas nutricionais nas fases etárias posteriores, como anemia e hipovitaminose A, riscos de acarretar graves problemas nutricionais nas fases etárias posteriores, como anemia e hipovitaminose A, ou excessos de nutrientes, como obesidade, diabetes e dislipidemias.

Unitermos: alimentação; lactente; nutrição de grupos de risco; transtornos da nutrição infantil.

Referências