



HISTORY OF BREASTFEEDING IN CHILDREN AND ADOLESCENTS WITH DIABETES MELLITUS TYPE 1

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ABSTRACT

The objectives were to identify children and adolescents with type 1 diabetes mellitus residents in Imperatriz-MA, to know the history of breastfeeding, the causes of early weaning and the consequent exposure to breast milk substitutes before the six months of life of these children or adolescents. This is a descriptive, cross-sectional, quantitative study developed between July 2014 and July 2016 with parents or caregivers of 10 children and 40 adolescents with type 1 diabetes mellitus. The participants were interviewed in their homes with prior scheduling. The average age of the subjects was 13.1 years old, 64.0% were females, early weaning was evidenced for 34 individuals and there was the insertion of whole cow's milk in the diet of 26 children besides juices, fruits, and other foods. It is concluded that exclusive breastfeeding up to 6 months is a safe, economical and emotionally satisfying way to feed babies.

INTRODUCTION

Breastfeeding (BF) is an important practice for reducing infant morbidity and mortality rates since breast milk is a complete food in terms of nutritional quality and the safest and cheapest way to ensure good health for the child. Exclusive breastfeeding until the sixth month (EBF) brings benefits both to the health of the child and to the health of the mother (Gomes, 2013). Breast-milk provides protection and increases immunity because the mother's antibodies are passed on to the baby through the milk, so the children who are breastfed get less sick, it provides a more intimate contact between the baby and the mother, and breast sucking is an excellent exercise for the development of orofacial musculature and provides adequate speech development, facilitating good breathing and making the gastrointestinal

system work well, avoiding gas and other discomforts such as diarrhea and giving hydration on the baby's skin (Boccolini *et al.*, 2011). Breast-milk protects the baby, being composed of circulating factors such as Secretory Immunoglobulin A, antibodies, immunoglobulin M and immunoglobulin G, macrophages, neutrophils, B and T lymphocytes, lactoferrin, fats, vitamins, and water, that is, it contains everything that the baby needs to have a healthy development and growth (Gomes, 2013). Also, BF acts directly or indirectly in the individual's future life, since it helps reducing chronic diseases such as diabetes, hypertension, and obesity, which are the predominant diseases of this century (Brasil, 2010). Early weaning is detrimental to the child, and a study indicates that there is a possible relationship between the development of type 1 diabetes mellitus (DM) and its association with early

weaning (Leal *et al.*, 2011). A non-systematic review study found that the duration, exclusivity of breastfeeding and early use of cow's milk may be possible risk factors for the development of diabetes. Substances contained in breast milk promote the maturation of the immune system by protecting it against type 1 diabetes because these bioactive substances are responsible for the energy balance that prevents excessive weight gain. Due to the scientific evidence, it is believed that the absence of breastfeeding is a possible modifiable risk factor for type 1 and type 2 diabetes (Pereira *et al.*, 2014). DM is a systemic, metabolic and chronic disease caused by an absolute or relative deficiency of insulin insufficiency and/or the inability of insulin to adequately exert its effects. When not properly treated, DM can lead to death, and the demand for high-cost hospitalizations, early disability, incapacity for work and deterioration of the quality of life (Guyton *et al.*, 2011).

DM has become a public health problem and its incidence grows rapidly. The International Diabetes Federation points out that there were about 371 million people with diabetes in the world in 2012. The Brazilian Diabetes Society (SBD) has shown that in 2012, 4.8 million people died due to diabetes, with half of all deaths in individuals under sixty years old. Only patients' costs were measured at 471 million dollars in 2012. The SBD estimated that by 2030, 300 million people will be diabetic (Loureiro *et al.*, 2011; Oliveira *et al.*, 2013). Type 1 DM may be related to the history of breastfeeding and diet offered in the first year of the child's life. When breast-milk with its anti-infective properties is no longer offered, the child is exposed early to other etiologic agents contained in breast-milk substitutes (Leal *et al.*, 2011). In view of this contextualization, the objective of the study is to identify children and adolescents with type 1 DM living in Imperatriz-MA, to know the history of breastfeeding, the causes of early weaning and the consequent exposure to breast-milk substitutes before six months life of these children or adolescents.

MATERIALS AND METHODS

Type of study

This is a descriptive, cross-sectional study of a quantitative approach carried out in the Brazilian Northeast, in the State of Maranhão, in the municipality of Imperatriz, from July 2014 to July 2016, with parents or caregivers of children and adolescents with type DM 1.

Participants

A search was performed on the registration forms of Hiperdia to identify patients with type 1 DM, since according to the System for Registration and Monitoring of Hypertensive and Diabetic Patients of Imperatriz, from 2011 to 2015, there were 49 patients enrolled among adults and children (Brasil, 2013). Also, 2 endocrinologists from the city were visited who also authorized access to patients by giving their contact. Also, there was a notification on the Facebook page of researchers looking for patients with type 1 DM. According to the World Health Organization (WHO) adolescence is the period between 10 and 19 years old (Who, 1995). The child is less than 10 years old. Those children with Type 1 DM, younger than 19 years of age, living in Imperatriz, registered or not at HiperDia, as long as their parents or caregivers accepted to participate in the study were included in the study.

The study subjects were the parents or caregivers of patients with type 1 DM, who were interviewed in their homes with the prior appointment by telephone, respecting their availability. There were factors that hindered to locate patients enrolled in HiperDia, since the addresses were not correct, and there was also a repetition of data. Thus, 50 children and/or adolescents whose parents and caregivers accepted to participate in the study were found.

Data collection

The data were collected through a structured form containing closed questions about the sociodemographic characterization, history of EBF, reason for weaning, diagnosis of type 1 DM and feeding practices.

Data analysis

The data were grouped, organized and analyzed in a descriptive way, showing the absolute and relative values of the investigated variables.

Ethical aspects

This research followed the ethical precepts and it was approved by the Research Ethics Committee of the Federal University of Maranhão with the opinion 661.524/2014 in accordance with resolution CNS 466/12 (Brasil, 2012).

RESULTS

There were 50 children or adolescents identified with type 1 DM living in Imperatriz-MA. Considering the age at which Type 1 DM was diagnosed among the individuals of this study, there were 12 (24%) diagnosed before 5 years old; 22 (44%) were 6 to 10 years old and 16 (32%) were 11 to 14 years old. Regarding the age, there was a variation of children from 4 to 19 years old, 13.1 was the mean age. Regarding the gender, there was 32 female (64%) and 18 (36%) male. Regarding the race, 20 (40%) were white, 2 (4%) was black and 28 (56%) were brown. Regarding birth weight, a variation of 2.3 kg to 3.9 kg was observed, with a mean of 3.1 kg (Table 1).

Table 1. Distribution of the sample studied according to age, gender, race and birth weight. Patients with type 1 DM, Imperatriz-MA, Brazil, 2016

Age	n	%
<5 years old	2	4.0
6 to 9	8	16.0
10 to 15	30	60.0
16 to 19	10	20.0
Gender		
Male	18	36.0
Female	32	64.0
Race		
White	20	40.0
Black	2	4.0
Brown	28	56.0
Birth weight		
<2500g	6	12.0
2500 to 3999g	44	88.0
Total	50	100

Breastfeeding was practiced with all 50 individuals studied. However, early weaning was found in 38 individuals, corresponding to 76% of the studied sample.

The data showed that 1 (4.0%) of the children was exclusively breastfed for less than 1 month, 5 (20.0%) were exclusively breastfed up to 4 months and 6 (24.0%) were exclusively breastfed until a sixth month (Table 2).

Table 2. Distribution of participants according to the history of SMA. Patients with type 1 DM, Imperatriz (MA), Brazil, 2016

Period	n	%
<1 month	1	4.0
1 months	1	4.0
2 months	2	8.0
3 months	10	40.0
4 months	5	20.0
5 months	-	-
6 months	6	24.0
Total	50	100

Regarding the reason for weaning given by the mother, it was identified that from 38 deponents who reported having weaned their child before six months, there were 16 (42.2%) promoting early weaning of their own volition; 8 (21.0%) reported a decrease in milk production as a reason for weaning; 3 (7,9%) attributed it to the clinical conditions of the mother; 3 (7,9%) reported problems with the nipples and 8 (21.0%) reported having weak milk (Table 3).

Table 3. Distribution of participants according to the reason for early weaning. Patients with Type 1 DM, Imperatriz – MA, Brazil, 2016

Reason for early weaning	n	%
Willingly	16	42,2
Low milk production	8	21,0
Maternal clinical conditions	3	7,9
Weak milk	8	21,0
Difficulties with the nipple	3	7,9
TOTAL	38	100

As for the foods offered early to children, there were 26 of them (52.0%) receiving cow's milk; 24 (48.0%) received industrialized milk, and 34 (68.0%) received thickened milk (porridge) with cornstarch, manioc mass or milk flour. Table 4 shows the foods ingested by the studied participants.

Concerning the family history of diabetes, 18 (36.0%) denied a history of the disease, while 32 (64.0%) reported having family members with diabetes, and 24 (75.0%) answered that the grandmas were the relatives affected with DM type II, and 4 (12,4%) the father and 2 (6,3%) the mother. Only 2 subject (6,3.0%) reported having a relative (prima) with the occurrence of type I DM. When asked about the occurrence of a health problem due to diabetes, 42 (94.0%) of them denied it and 2 (4.0%) stated they had glaucoma, 2 (4.0%) of recurrent tonsillitis and 4 (8.0%) reported healing problems.

Table 4. Sample distribution according to food intake. Patients Type 1 DM, Imperatriz-MA, Brazil, 2016

Food	n	%
Whole cow's milk	26	52.0
Processed milk	24	48.0
Porridge (maize starch, manioc mass, dairy flour)	34	68.0
Fruits and juices	30	60.0
Soups: vegetables and meat	26	52.0
Soft drinks	24	48.0
Sweets, Candy, Chocolates	16	32.0
Cookies and Sandwich Cookies	20	40.0

DISCUSSION

In this study, there were 44.0% of the subjects with the diagnosis of the disease ranging from 6 to 10 years old. The diagnosis of DM in the child or adolescent can cause anxiety since it is a chronic disease that will certainly interfere with the daily life of the patient and will require several adaptations in family life (Santos *et al.*, 2013, Tavares *et al.* 2011). A study conducted in Juiz de Fora-MG showed that the diagnosis of type 1 DM in participants of that study varied in children aged less than 1 year old to 16 years old, with a mean age of 8 years old. Regarding the subjects' ages, the same study ranged from 4 to 18 years old (Leal *et al.*, 2011), data similar to this study. Regarding the gender, 32 (64.0%) of the subjects were female, and the birth weight varied between 2,500g and 3,999g and brown. In other studies, most were also female and had a similar weight at birth, although they were white (Leal *et al.*, 2011 Vitor *et al.*, 2010). The results of this study showed that all children breastfed, but at 6 months only 6 children (24.0%) were in SBF, showing that the introduction of complementary feeding before 6 months of the child's life may have been the cause of early weaning.

Children who are fed exclusively breast milk in the first weeks and months of life may reduce the risk of type 1 DM in early childhood by up to 15.0%, but the association between type 1 DM and early weaning is not definitive, as there are other risk factors for diabetes, such as maternal diabetes, birth weight, gestational age and maternal age (Cardwell *et al.*, 2013). Early weaning and introduction of cow's milk may contribute to the development of type 1 DM. Human milk is believed to contain substances that promote the maturation of the immune system, which protects against the onset of type 1 DM (Pereira *et al.*, 2014). The last study carried out by the Ministry of Health (MS) to verify the current situation of breastfeeding and complementary feeding in Brazil, from 1999 to 2008, showed that the prevalence of SBF in children under six months was 41.0 %. The median duration of EBF was 54.1 days (1.8 months) and the median duration of breastfeeding was 341.6 days (11.2 months). The prevalence of EBF in children under 4 months was increased from 35.5% in 1999 to 51.2% in 2008 (Venâncio *et al.*, 2010).

A study conducted in Imperatriz-MA by Santos (2016) showed that the prevalence of EBF at 6 months was 2.8%. WHO global data from different countries indicate SBF rates at birth almost 90.0%, but at 6 months they reach 25.0% (Who, 2009). Thus, the rates of EBF in Imperatriz are below the national and international average. A study carried out in Australia between 1981 and 1983, in which the association between children who never breastfed and who exclusively breastfed for up to 4 months and those who exclusively breastfed for more than 4 months, found that breastfeeding for more than 4 months has a substantial protective effect against the development of DM in young adulthood. They concluded that promoting EBF for at least 4 months may be a useful strategy for diabetes prevention among young adults (Mamun, 2015). Many reasons are claimed by mothers to wean their children or early offer other liquids, artificial milk and food. In this study, 41.0% of the mothers reported they did not want to breastfeed their children anymore. In Londrina-PR in 2008, the research of Souza *et al.* (2012) showed that bottle and pacifier use was associated with weaning, and children who were offered artificial beaks were less likely to be in EBF.

A study conducted in Juiz de Fora-MG showed that 32.0% of the mothers of patients with DM type 1 reported they weaned their children voluntarily, 21.0% reported a decrease in milk production, 10.0% reported having weak milk, and 3.0% reported breast lesions (Fialho *et al.*, 2014). Other reasons considered to be decisive for early weaning were work, maternal disease, persistent crying and weak milk, breast engorgement and nipple fissures, newborn colic, previous experience with prolonged breastfeeding and rejection of the child in breast milk (Rodrigues *et al.*, 2014). “Insufficient milk” and “weak milk” permeate the testimonies of women who wean prematurely. It is believed that these claims are strongly rooted in culture and the most used constructs as an explanatory model for the abandonment of breastfeeding and can be interpreted as a request for help in the face of difficulties experienced in breastfeeding (Polido *et al.* 2012). In this research, 52.0% of the subjects ingested cow's milk and 48.0% industrialized milk. In Brazil, many infants begin to be fed whole cow's milk before six months old and 80.0% already receive whole milk at the end of the first year of life. The relatively high cost of infant formulas for Brazilian infants can explain their use by only 12.0% of infants less than six months old and only 6.7% of those older than six months. This may possibly explain the high percentage of meals in which infant formula is diluted or inappropriately concentrated through other additives including sugar and chocolate (Greer, 2010). Early exposure to cow's milk may be an important determinant of type 1 DM, considering the fact that 30.0% of cases of type 1 DM could be avoided if children up to 3 months old did not receive cow's milk, since there is the relationship between the early introduction of complementary feeding and the development of atopic diseases (Fialho *et al.*, 2014).

Regarding the history of DM, 64.0% had relatives with the disease. A similar study showed that the family history of DM was confirmed in 45.6% of the respondents (Leal *et al.*, 2011). Considering the occurrence of health problems, 16.0% of the participants had problems such as glaucoma, recurrent tonsillitis or problems with scarring. Since DM is a chronic degenerative disease, it is important to accompany the patients with the disease, focusing on the preventive issue, developing a solid educational base to alleviate the complications inherent to this pathology (Leal *et al.*, 2011).

Conclusion

The results of this research show that the mean age was 13.1 years old and there was a predominance of females. The early weaning was evidenced in the study since most of the subjects were not exclusively breastfed until the sixth month. It was also observed that food was introduced to children early, such as cow's milk, processed milk, fruits and juices, soda, sweets such as candies and sandwich cookies, which may have contributed to the onset of type 1 diabetes mellitus. Thus, it is realized that exclusive breastfeeding is a safe, economical and emotionally satisfying way to feed babies, as it provides protection for these children against prevalent diseases. There is no doubt that this discussion will be able to equip health professionals to promote breastfeeding, since as they encourage, accompany, assist and mainly guide the mother-father-family group in the implementation of exclusive breastfeeding until the sixth month, contributing to increased breastfeeding rates, mobilizing health professionals and authorities for actions that prevent early weaning.

Conflict of interest

The authors certify that there is no conflict of interest.

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