

Feeding practices in Tunisian infants during the first 6 months

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RÉSUMÉ

Introduction : Le lait maternel reste le modèle de l'alimentation du nourrisson de fait de ses bienfaits aussi bien pour le nourrisson que pour la mère. Depuis 2001, l'OMS recommande un allaitement maternel exclusif jusqu'à l'âge de six mois. L'objectif de ce travail était de décrire et d'évaluer les pratiques de l'alimentation du nourrisson au cours des six premiers mois de vie et d'identifier les facteurs associés à un allaitement maternel de courte durée en Tunisie.

Méthodes : Etude longitudinale, prospective, comparative, de 260 nourrissons inclus à l'aide d'un questionnaire réalisé par un diététicien dans deux centres de santé de base de situation géographique et socio-économique différentes évaluant les pratiques alimentaires à la naissance, à l'âge de 4 mois et 6 mois.

Résultats : À la naissance, 84,6% des nouveau-nés avaient été allaités au sein. 46,6% et 44,7% des nourrissons avaient été exclusivement allaités au sein à l'âge 4 mois et de 6 mois respectivement. A l'âge de 4 mois, 49,6% des nourrissons recevaient du lait maternisé contre 42,% à l'âge de 6 mois. 3,9% des nourrissons recevaient du lait de vache de commerce à l'âge de 4 mois et 12,9% à l'âge de 6 mois. Le lait de vache a été introduit avant 4 mois dans 3,9% des nourrissons. La durée de l'allaitement maternel était plus longue si les conseils alimentaires étaient fournis par un diététicien ($p = 0,017$) et si un médecin généraliste était le médecin traitant ($p = 0,004$). Les facteurs associés de façon indépendante à un allaitement inférieur à quatre mois étaient l'âge de la mère inférieur à 35ans ($p=0,014$; ORaj IC 95% 2,6 [1,2-5,4]) et le pédiatre en tant que médecin traitant, ($p=0,023$; ORaj 95% 3,1 [1,2-5,4]).

Conclusion : Notre étude a montré que l'allaitement maternel dans notre population ne répondait pas aux recommandations et qu'un renforcement des connaissances des mères âgées de moins de 35 ans et des conseils prodigués par les pédiatres étaient nécessaires.

Mots clés : Allaitement maternel, durée, facteurs épidémiologiques, promotion.

ABSTRACT :

AIMS : To describe and evaluate infant feeding practices during the first 6 mo of life and to study the factors associated with short-term breastfeeding in Tunisia.

Methods : Data from 260 Tunisian infants were collected by a questionnaire conducted by dietician in two primary health care centers in two different geographically and socio-economically areas measuring feeding practices at birth, 4 and 6 months.

Results : At birth, 84.6% of mothers started breastfeeding. The proportion of exclusively breastfed infants was 46.6% at 4 mo and 44.7% at 6 mos. At the age of 4 and 6 mos, 49.6% and 42.9% of infants received formula, 3.9% and 12.9% were given cow's milk, respectively. Cow's milk was introduced before 4 months in 3.9% of the infants. Duration of breastfeeding was longer if dietary advice were given by the dietician ($p = 0.017$) and if a GP was the attending physician ($p= 0.004$).

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Mothers less than 35 years old ($p = 0.014$; ORaj IC 95% 2.6 [1.2-5.4]) and paediatricians as a attending physician ($p = 0.023$, ORaj IC 95% 3.1 [1.2-5.4]) were identified in the multivariate analysis as a major factor negatively associated to breastfeeding of less than four months.

Conclusion : This survey indicates that Tunisian infants are not fed in accordance with infant feeding recommendations during their first 6 mo of life. Infant feeding practices are significantly associated with maternal age and the quality of the attending physician. National guidelines for feeding infants, in accordance with international recommendations, should be promoted in Tunisia, together with educational programmes.

Keywords : Breastfeeding, duration, epidemiologic factors, promotion.

INTRODUCTION :

The importance of breast milk as a primary preventative intervention is widely known and understood by most healthcare providers. Breastfeeding has long been associated with better health, immunological advantages, and cognitive outcomes for children from infancy through early adulthood (1-4). Since 2001, the World Health Organization (WHO) has recommended exclusive breastfeeding for six months and continued breastfeeding up to two years. Nevertheless, it is accepted that breastfeeding lasting longer than three months is also beneficial for the infant. However, rate of exclusive breastfeeding is alarmingly getting lower and lower in our country. The purpose of this article was to study the factors associated with short-term breastfeeding in Tunisia.

MATERIAL & METHODS :

We conducted a longitudinal prospective and comparative study including infants of both sex, seen at 40-day, 4-month, and 6-month age for vaccinations or systematic monthly check-up, in two Primary Health Care Centers (PHCC) in two different geographically and socio-economically regions: the PHCC of Sidi Hassine on 2007/2008 and the PHCC of Bellevue on 2009/2010. Couples (mother-child) coming to the centers for routine vaccinations and monthly check-ups were included. In case of twins, one of both was included in the study. Infants with a family history of atopy (asthma, eczema, rhinitis, allergic conjunctivitis and food allergy in at least one parent or in the siblings) had also been included in the study. Newborns or infants with severe illness requiring prolonged hospitalization, special treatment or special diet (hereditary disease of metabolism, cow's milk allergy), newborns of parents refusing to participate in the study, were excluded. Structured questionnaire on feeding practices were conducted by dieticians of each PHCC with all the mothers of infants included in our study.

Data collected included sex, rank in the family, birth weight, number of siblings, family history of atopy, consanguinity of parents, custody arrangements, source of dietary advice, attending physician (GP or paediatrician), mothers characteristics (age, urban or rural origin, education level, social status category) and foods given at different ages.

Based on the WHO definitions on breastfeeding (5), the breastfed infants at 6 mo of age were categorized into three groups: (i) Exclusively breastfed infants received breast milk, no solid or semisolid foods, no formula/other milk or water/water-based drinks/fruit juices daily or weekly, but possibly vitamin-mineral supplement, (ii) Predominantly breastfed infants received only water/water-based drinks/fruit juices daily or weekly in addition to breast milk, and possibly vitamin-mineral supplement, (iii) Partially breastfed infants received solid/semisolid foods and/or formula/ other milk daily or weekly, in addition to breast milk. Water/water-based drinks/fruit juices could also have been given daily or weekly, and possibly vitamin-mineral supplement. Breastfed infants included all infants in the three categories.

STATISTICAL ANALYSIS :

Statistical analyses were performed with the SPSS software, version 11.5. Categorical variables were expressed with frequencies and percentages. Continuous variables were expressed with mean and standard deviation. To identify factors predicting a short-term breastfeeding, infants were divided into two groups; those breastfed for less than four months and those received breast milk for at least four months. Differences between groups were evaluated using Student's t test for parametric continuous data and Mann-Whitney U test for non-parametric continuous data. Proportions were comparing using χ^2 test or Fisher's exact P test. The odds ratio (OR) is an estimate of relative risk and was used as a measure of the strength of association between individual risk factors and short-term breastfeeding. To take into account the matching, p-value was calculated.

It was considered as statistically significant if smaller than 5%. Multivariate descendant logistic regression analysis was used to identify factors that predicted short-term breastfeeding. Adjusted Odds ratios and their 95% confidence intervals were reported.

RESULTATS :

Three hundred infants were initially included in our study. But only 260 completed questionnaires were received : 132 from the PHCC of Sidi Hassine and 128 from the PHCC of Bellevue (40 questionnaires were excluded because incompletely filled). Epidemiological Characteristics of infants of each primary health care are summarized in table 1.

Table 1 : Epidemiological characteristics of infants according to the primary health center of origin.

		Sidi Hassine center N(%)	Bellevue center N(%)	P
Infant gender	Boy / Girl	61(46.2) / 71(53.8)	62(48.4) / 66(51.6)	NS
Rank in the family	1	56(42.4)	52(40.6)	NS
	2	38(28.8)	42(32.8)	
	3	27(20.5)	23(18)	
	4	9(6.8)	10(7.8)	
	5	2(1.5)	1(0.8)	
Birth weight	Low birth weight < 2.5 kg	14(10.6)	6(4.7)	NS
	Eutrophic [2.5 - 4 kg]	105 (79.5)	108 (84.4)	
	Macrosomia > à 4 kg	13(9.8)	14(10.9)	
Number of siblings	1	56(42.4)	49(38.3)	NS
	2	35(26.5)	46(35.9)	
	≥3	41(31.1)	33(25.8)	
Family history of atopy	No / Yes	104(78.8) / 28(21.2)	103(80.5) / 25(19.5)	NS
Consanguinity	No / Yes	102(77.3) / 28(21.2)	103(80.5) / 25(19.5)	NS
Custody arrangements	Nursery	3(2.2)	4(3.1)	NS
	Childminder	1(0.8)	4(3.1)	
	Infants family	124(93.9)	117(91.4)	
	Host family	4(3.1)	3(2.3)	
Attending physician	Paediatrician / GP	122(92.2) / 10(7.8)	93(72.7) / 35(27.4)	<0.001
Source of dietary advice	Pediatrician or GP	60(45.5)	15(11.8)	<0.001
	PHCC dietetician	7(5.3)	97(75.8)	
	Personnel experience	31(23.5)	2(1.6)	
	Other (family, books, ...)	34(25.7)	14(10.8)	
Maternal origin	Rural/Urban	89(67.4) / 43(32.6)	2(1.6) / 126(98.4)	<0.001
Maternal age (years)	15 - 24	24(18.2)	10(7.8)	0,005
	25 - 34	80(60.6)	72(56.3)	
	35 - 44	28(21.2)	46(35.9)	
Level maternal education	Illiterate	15(11.4)	0(0)	<0.001
	Elementary level	63(47.7)	37(28.9)	
	Secondary level	49(37.1)	55(43)	
	Superior level	5(3.8)	36(28.1)	

Maternal social status category	House wife	112(84.8)	97(75.8)	0,001
	Worker	18(13.7)	14(10.9)	
	Middle management	1(0.8)	15(11.7)	
	Senior management	1(0.8)	2(1.6)	
Level paternal education	Elementary level	63(47.7)	21(16.4)	<0.001
	Secondary level	56(42.4)	69(53.9)	
	Superior level	13(9.8)	38(29.7)	
Paternal social status category	Unemployed	2(1.5)	1(0.8)	<0.001
	Workman / journeyman	73(55.3)	48(37.5)	
	Middle management	50(37.9)	51(39.8)	
	Senior management	7(5.3)	28(21.9)	

Milk-feeding practices during the first six months of life are shown in Table 2. Within 48 hours of delivery, 84.6% of mothers started breastfeeding : 75% in the primary health care center of Sidi-Hassine vs 94.5% in the primary health care center of Bellevue (p=0.0007). At the age of 4 and 6 months, 46.6% and 44.7% of the infants, respectively, were still exclusively breastfed, 49.6% and 42.9% received formula, and 3.9% and 12.9% were given cow's milk. Infant formula was introduced at the mean age of 1.7±1.5 months. At birth, 5.7 % of the infants were formula fed only, and 9.5% formula supplemented. Fifty percent and 43% of infants received formula at the age of 4 and 6 months respectively. Cow's milk was introduced at the mean age of 5.3 months. Cow's milk was introduced before 4 months in 3.9% of the infants. At the age of 6 months, the percentage of infants who consumed cow's milk as the only milk beverage was 12.6%. Breastfeeding was more common than formula until the age of 6 months.

Table 2 : Distribution of infants by type of milk received at birth at four and six months.

Age	Type of milk	Sidi Hassine center N(%)	Bellevue center N(%)	P
At birth	Breast-feeding	99(75)	121(94.6)	0.0007
	Infant formula	12(9.1)	3(2.3)	
	Mixed feeding	21(15.9)	4(3.1)	
4 months	Breast-feeding	62(47)	59(46.1)	NS
	Infant formula	32(24.2)	16(12.5)	
	Mixed feeding	30(22.7)	51(39.8)	
	Cow's milk	8(6.1)	2(1.6)	

6 months	Breast-feeding	60(45.5)	56(43.8)	NS
	Infant formula	24(18.2)	23(18)	
	Mixed feeding	21(15.9)	43(33.6)	
	Cow's milk	27(20.5)	6(4.7)	

The mean duration of breastfeeding in our population was 4.8 ± 2 months. This duration was significantly lower in the PHCC center of Sidi Hassine than that of Bellevue (4.4 ± 2.2 vs 5.2 ± 1.7 months) ($p = 0.0007$).

Exclusive breastfeeding was mined for an average of one month in the two centers. The proportion of exclusively breastfed infants was 37% at one month, and less than 5% at five months. The mean duration of breastfeeding in conjunction with others liquids like mineral water and herbal teas in the PHCC of Sidi Hassine was 3.9 ± 1.5 months vs 2.3 ± 1.5 months in the PHCC of Bellevue.

Factors associated with breastfeeding duration :

The univariate analyses identified two variables as having significant association with duration of breastfeeding : source of dietary advice and attending physician.

Duration of breastfeeding was longer if dietary advice were given by the dietician ($p = 0.017$) and if a GP was the attending physician ($p = 0.004$). Multivariate regression analysis identified slightly different variables independently associated with the duration of breastfeeding. Young mothers breastfed their infant for a shorter period ($p = 0.01$); 15,6% of the mothers of group1 were older than 35 vs 32.1% in group 2 ($p = 0.014$; ORaj IC 95% 2.6 [1.2-5.4]). Furthermore, the paediatrician as a attending physician was a major factor negatively associated to breastfeeding of less than four months ($p = 0.023$, ORaj IC 95% 3.1 [1.2-5.4]). No significant association was found between duration of breastfeeding and infant gender, rank in the family, birth weight, number of the siblings, family history atopy and consanguinity of the parents. In our study, the breastfeeding duration was no influenced by maternal origin, educational level and socio-economic factors of parents and the infant's custody arrangements.

DISCUSSION :

The present survey provides data on infant feeding practices in Tunisian population and factors associated with the duration of breastfeeding. It has been made using a detailed questionnaire on a representative sample consisting of 260 respondents from two PHCC in two different geographically and socio-economically regions. It is difficult to compare rates of breastfeeding between different studies, owing to different definitions, methods of sampling and data collection. The results of the present survey show that the rate of breastfeeding initiation at

birth (94.3%) seems to be satisfactory compared to international standards. It is higher than in other developed countries like in Italy (6) and Spain (7), but it is still below that of Norway (8) and New Zealand (9). About 44.7% and 69.5% of our infants still exclusively breastfeed and breastfeed at 6 months respectively. The duration of breastfeeding rapidly decreases. Only 46.6% of mothers exclusively breastfed their infants 4 months after delivery. Factors mainly associated with short-term breastfeeding were the source of dietary advice, quality of the attending physician (paediatrician or GP) and the age of the mother. The present survey shows that the follow up of infants by a paediatrician was independently associated with a short duration of breastfeeding. It shows that paediatrician does not ensure a correct breastfeeding promotion. A larger-scale survey of paediatricians is needed to verify these findings concerning infants feeding practices. Paediatricians and neonatologists play a critical role in their practices as advocates of breastfeeding and thus should be knowledgeable about the health risks of not breastfeeding, the economic benefits to society of breastfeeding, and the techniques for managing and supporting the breastfeeding dyad (10).

Other health professionals, particularly midwives and paediatric nurses, have also an important role in the protection, promotion and support of breastfeeding (11).

Nevertheless, to effectively facilitate breastfeeding, they need specific knowledge and skills (12) accompanied by a positive attitude toward breastfeeding (13). Despite the critical role of paediatricians to serve as advocates and supporters of successful breastfeeding, studies have demonstrated lack of preparation and knowledge and declining attitudes regarding the feasibility of breastfeeding, leading to a shortening of the duration of breastfeeding (14-16). While research shows superiority of breast milk over formula, many health professionals are ambiguous about breastfeeding and some studies have shown that messages given to mothers about breastfeeding are perceived as ambivalent and negatively affect the initiation and duration of breastfeeding (17) (réf 29). On 1999, Schanler et al showed that the majority of the 1602 paediatricians interviewed considered breastfeeding and infant formula as equivalent practices (17).

In addition, younger paediatricians were less confident than older paediatricians in managing breastfeeding problems (18). Paediatricians in Italy have positive disposition towards infant feeding but their knowledge and practices are suboptimal with respect to the WHO criteria. For this reason, several paediatric societies all over the world developed breastfeeding educational intervention. The American Academy of Pediatrics provides a wealth of breastfeeding-related material and resources to assist and support paediatricians in their critical role as advocates of infant well-being (19). Italian Paediatric Societies represented a scientific and ethi-

cal reference tool for a more effective commitment of neonatologists and a to increase breastfeeding among Italian paediatric population (13). Experts and knowledge users in Canada developed and implemented a national breastfeeding educational intervention at the postgraduate residency level with the goal of impacting breastfeeding rates and duration, which will lead to improved maternal and child outcomes (20). Several studies showed that the disposition and knowledge of professionals are significantly influenced by their personal experience (17) (réf 37). Paediatricians with no personal breastfeeding experience were significantly more likely to consider breastfeeding equivalent to infant formula compared to those with personal experience of breastfeeding (17, 21). Analysis of the association between paediatricians' breastfeeding experiences and their attitudes revealed paediatricians are knowledgeable about breastfeeding and have positive attitudes towards breastfeeding (22). We found no association between the duration of breastfeeding and infant gender. Our results were similar with findings of several recent surveys (7). But, this association reported is not found to be consistent. Norwegian study found that the breastfeeding duration was longer for girls than for boys (23). Scott et al found that male infants were more likely to be weaned at any time compared with female infants (24). No significant association was found between birth weight and the duration of breastfeeding. This finding is in accordance with Australian data (24). Whereas in the United States, infants breastfed for less than 4 months were smaller at birth than those who were exclusively or partially breastfed for 4 mo (25).

Similar figures were reported from Norway (8). Maternal perceptions of insufficient breast milk supply in case of low birth weight was pervasive among studies included in a systemic review (26). A high proportion of mothers are convinced that breast milk does not contain enough nutrients than infant formula that allows faster weight gain. This practice leads to a vicious circle that causes a decrease in lactation. Rank in the family and number of siblings had no association with duration of breastfeeding in our study. Whereas other surveys showed that duration of breastfeeding increased with increasing number of children. Association between number of children and breastfeeding practice can be related to previous breastfeeding experience. In Hungary, Nagy et al found that the duration of breastfeeding of the second child was significantly related to previous breastfeeding experience, with increased average breastfeeding duration with the second child, but not with the third (21).

Findings from Algeria and Yemen showed that the elders were earlier weaned from breastfeeding than the other siblings (27). In New Zealand, Children were more likely to be breastfed if they had older siblings (9). Breastfeeding was the rule before the 60s in Tunisia, in accordance with religion and social habits. However, after the country's independence,

two facts contributed to the decrease in the rate of breastfeeding: urbanization of the rural population and the access of women to the labour market and education, in addition to the marketing of infant's formula. According to our results, educational level and socio-economic status had no influence on breastfeeding duration. However, earlier Tunisian and several other studies showed a significant association between breastfeeding duration and mother's high educational level (28-31).

In New Zealand, children were more likely to be breastfed for more than 6 months if their mother had a tertiary education (9). But this association is controversial since some surveys showed that illiterate mothers breastfed their children longer than educated women (27). In our study, no association was found between the women working and the duration of breastfeeding, contrary to other earlier Tunisian, Spanish and German surveys and to a systemic review including 25 studies from 19 countries which showed that woman working was negatively associated with the duration of breastfeeding (26, 30,32-35).

We found no association between mothers rural or urban origin and duration of breastfeeding, contrary to earlier Tunisian study which showed that higher breastfeeding prevalence was associated with living in rural areas (32-34). Similar figures were reported from Algeria, Morocco, Yemen, Egypt, Jordan, Sudan and Syria (27). The observation that young mothers breastfed for a shorter period has been shown in the present survey and in several others (6, 7, 26). Previous breastfeeding experience was identified as major factor associated with a long-term breastfeeding (17, 21), which could explain why young mothers breastfeed their children for a shorter period since they have not this experience. The present survey showed that compliance with international recommendations on cow's milk was poor. In fact, 3.9% and 12.9% of mothers had given cow's milk to infants before 4 and 6 mo, respectively. The introduction of cow's milk in our population was earlier than in developed countries (36, 37). Because early introduction of cow's milk can increase the risk of iron deficiency and provides an inadequate source of energy for infants as it was demonstrated by both the American Academy of Pediatrics and the Institute of Medicine which recommend delaying the introduction of cow's milk until after 1 year of age (38, 39), reasons for non-compliance with current international recommendations should be further investigated in Tunisia, and preferably removed.

CONCLUSION :

Breastfeeding is a natural and beneficial source of nutrition and provides the healthiest start for an infant. Paediatricians continue to improve on breastfeeding recommendations over time, concurrent with the upswing of the Baby-Friendly Hospital Initiative in the United States. Within the limitations

of this survey, it can be concluded that the current rate of breastfeeding initiation in Tunisia is fairly acceptable, but that the duration of breastfeeding and practices of complementary feeding are still inadequate. Paediatricians have demonstrated a modest decline in attitudes about the potential for breastfeeding success and do not ensure a correct breastfeeding promotion. There are continued opportunities to enhance training in breastfeeding and participate in breastfeeding management and support. Mothers should be encouraged to adopt favourable attitudes towards breastfeeding, and should be instructed correctly on complementary feeding. National guidelines for feeding infants, in accordance with international recommendations, should be promoted in Tunisia, together with educational programmes.

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