

Faulty Weaning Practices among Infants in Suez Canal Area and its Complications

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Abstract

Background: Faulty Complementary feeding (CF) is a worldwide problem that increases risk of malnutrition, gastrointestinal, respiratory illness, childhood obesity, allergic manifestation, and immune system disorders. **Aim:** to investigate the impact of faulty practices of complementary feeding on growth parameters, and to focus on the common adverse effect. **Subjects and Methods:** Our study is a cross sectional study that was carried out in Outpatient Clinics of Pediatrics at hospitals and health care units in Suez Canal area. A well-designed Questionnaire was done to show the pattern of CF of 418 infants below 2 years selected in sequence. Infants with positive family history of allergy, congenital anomalies, debilitating systemic disease and infants under treatment were excluded from the study. We made a 20 minutes interviews with mothers of included infants to answer questionnaire about the dietetic history. Anthropometric measures and full examination was done for every infant. **Results:** Our results showed that the incidence of faulty CF was (58.7%), mothers who introduced complementary feeding before 4months was (47.5%), their infants were more exposed to gastrointestinal illness (52.2%), respiratory illness (76%), eczema (51.8%) and mouth ulcers (74.6%), than infants who started CF at the age 4-6months and after 6months . Infants who started CF after 6months were more exposed to be underweight (43.2%)and to have manifestations of pallor and vitamin D deficiency (37%). **Conclusion:** Introduction of food before 4months leads to significant high incidence of gastrointestinal illness, eczema, respiratory illness, mouth ulcer, and obesity while, introduction of food after 6months lead to the risk of underweight and manifestations of pallor and vitamin D deficiency.

Keywords: complementary feeding, growth, infectious disease, allergic manifestations

Introduction

The introduction to solid feeding and gradual replacement of milk by solid food as the main source of nutrition is the process known as complementary feeding .WHO recommended that mothers should breast feed their children exclusively for six months of life to protect against allergic manifestation, diarrhea and respiratory tract infection⁽¹⁾. In its recent publications WHO issued a statement, referring to a Cochrane meta analysis suggests that exclusive breastfeeding for 6 months shows a deficit

in weight and length gain and compromise hematological status of infants. So, recommended that infants be exclusively breastfed for 4–6 months as delay weaning until 6 months of age, will expose infants to growth and nutritional deficiency versus the risks of infection, associated with earlier complementary feeding⁽²⁾. In developing countries, introduction of solid food early increase risk of gastrointestinal infection due to contamination of food. Early aggressive complementary feeding or excess sugary food leads to colic and constipation. Sudden feeding on starchy food lead to Kwa-

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shiorakor⁽³⁾. Sufficient volume of breast milk from a well nourished mother should supply the nutrient needs of the infant until 6 months of age except vitamin D, zinc, iron and other micronutrients. So complementary feeding should be at 4 -6 months of age in a gradual process with special needs of groups as low birth weight (LBW) or preterm infants⁽³⁾. Protein energy malnutrition and micro-nutrient under-nutrition occur together, 10 million children under the age of 5 years old die each year. More than half of the deaths occur because of malnutrition. Nearly 2/3 of the deaths could be prevented by managing strategies to optimize nutritional status⁽⁴⁾. The suggested allergy preventing effect of exclusive breastfeeding may be due to a reduced exposure to dietary antigens, immunologically active factors in human milk extending from mothers to infant during first months of life⁽⁵⁾. Due to deficiency of researches in Suez Canal area about the faults associated with complementary feeding, we organized this study.

Subjects and Methods

The study was a cross sectional study, carried out in Outpatient Clinics of Pediatrics including General Suez hospital, Suez Canal University hospital, General Port Said Hospital and health care units in Suez Canal area. It included 418 infants below the age of two years selected in sequence from selected sites.

Subjects

Simple random method was used. Sample included all infants below age of two years. Infants with positive family history of allergy, infants with major congenital anomalies, debilitating systemic disease, or Infants of special feeding formula as treatment were excluded. We made 20 minutes interview with mothers of included infants to answer questionnaire. A pilot study to evaluate the ques-

tionnaire was conducted on 100 selected infants less than two years from selected sites. The pilot study demonstrated that the methods and procedures are valid.

Methods

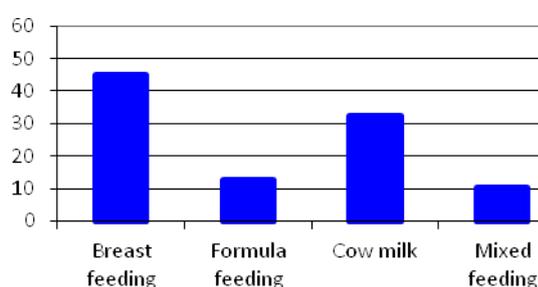
All mothers were asked about: i) personal history (age, sex, residence, order of birth, occupation, socioeconomic status, consanguinity, and income), ii) -vaccination and medication history, iii) past history of disease, iv) Full dietetic history (type of milk, age of weaning, type of weaning, type of food which was first introduced to the infants and its reaction to it), v) Allergic manifestations (respiratory; persistent cough and wheezes, skin; atopic dermatitis with typical itchy papulovesicular rash in face, neck and extremities that is chronic and relieved by topical steroids, and mouth ulcer), vi) Any gastrointestinal tract manifestations (vomiting, constipation, diarrhea, abdominal distension, streaks of blood in stool). All infants were subjected to general examination and anthropometric measures (weight/age, length/age, head circumference and chest/head circumference ratio) and were put on Egyptian percentile (underweight, short stature, small head who are below 5th percentile but overweight, tall stature, large head who are above 95th percentile

Results

Most of studied infants (43.3%) aged 7-12 months (mean 9.0±5.9), males were slightly more than females (56.2% vs. 43.8%, respectively) (Table 1). We found that 47.5% of the mothers started complementary feeding before 4 months while, 11.2% exclusively breastfed till 6 months. Concerning type of food started with 22.2% of mothers began with yoghurt and cow milk (Table 2). Infants fed on breast-feeding represented 45.7% while 12.7% used formula feeding, 32.3% used cow milk, and 9.3% used mixed feeding (Figure 1).

Table 1: Socio-demographic characteristics of the studied infants (n=418)

Age (months)	
Mean \pm SD	9.02 \pm 5.9
Range	1 – 24
Age groups No (%)	
\leq 6 months	147 (35.2)
7 -12 months	181 (43.3)
13 - 18 months	66 (15.8)
19-24 months	24 (5.7)
Gender	
Male	235 (56.2)
Female	183 (43.8)

**Figure 1:** Type of milk given among the studied infants

We found that 69.7% of the infants eat adequate amount of food, 24.2% of them eat limited variety of specific food, and 75.8% eat unlimited variety of specific food. Vomiting was the most common cause of inadequate feeding among the studied infants (Tables 4). The main cause of early complementary feeding before 4 months was the community thoughts to prepare their infants to eat on ordinary food as adults (38%) followed by working mothers (27.3%) as in (Table 5). The prevalence of studied infants who were underweight was (8.9%) of total population, most of them of underweight were complementary fed after 6 months (43.2%). The prevalence of studied infant who were overweight was (3.5%) of total population, most of them were complementary fed before 4 months (66.7%) as in (Table 6). The prevalence of gastrointestinal illness in studied infants was 65%; the majority of infants who started complementary feeding <4 months of age represented 52.2% of infants who had

gastrointestinal illness, (group 1 vs. group 2, $p=0.004$), (group 2 vs. group 3, $p=0.004$) and (group 1 vs. group 3, $p=0.001$).

Table 2: Characteristics of complementary feeding practices among the studied infants (n=356)

Onset of complementary feeding no (%)	
- < 4 months	169 (47.5)
- 4 - 6 months	147 (41.3)
- > 6 months	40 (11.2)
Type of first food introduced no (%)	
- Yoghurt, cow milk	79 (22.2)
- Yoghurt, vegetables, cheese, egg yolk	77 (21.6)
- Yoghurt and cereal	52 (14.6)
- Yoghurt, rice, potatoes	31 (8.7)
- Cereal only	23 (6.5)
- Cereal, rice, potatoes	61 (17.1)
- Vegetables and fruits juices or fruits	33 (9.3)

Table 3: Feeding practices and causes of inadequate feeding of the studied infants

Infant eat adequate amount of food	
No	108 (30.3)
Yes	248 (69.7)
Infant eat limited variety of specific Food	
No	270 (75.8)
Yes	86 (24.2)

Table 4: Behavior of inadequate of feeding among the studied infants

Causes of inadequate of feeding (food refuse)	No. (%)
Crying	8 (7)
Refuse to open mouth	21 (19)
Not swallowing and accumulate food in Mouth	13 (12)
Push food away	11 (10)
Gagging reflex	20 (18.5)
Vomiting	35 (33.5)

The prevalence of respiratory illness in the complementary-fed infants was 49.2%. The majority of them (76%) were those who started CF < 4 months (group 1 vs. group 2, $p=0.001$), (group 2 vs. group 3, $p=0.003$), and (group 1 vs. group 3, $p=0.001$). The prevalence of atopic dermatitis in complementary-fed infants was 70.5%. The majority of them (51.8%) were those who started CF < 4 months (group 1 vs. group 2, $p=0.003$), group 2 vs. group 3, $p=0.001$, and (group 1 vs. group 3, $p=0.001$). Mouth ulcer was seen in 37.6% of complementary-fed infants, the majority (74.6%) of them was observed in infants who started CF < 4 months, (group 1 vs. group 2, $p=0.001$), (group 1 vs. group 2, $p=0.009$) and (group 1 vs. group 3, $p=0.001$). Vitamin D deficiency and pallor were observed in 30.3% of the studied infants, the majority (37%) of them were those who started CF after 6 months, (group 1 vs. group 2, $p=0.001$), (group 2 vs. group 3, $p=0.001$), and (group 1 vs. group 3, $p=0.001$) (Table 7).

Discussion

Our results illustrated that 45.7% of infants were on breastfeeding, 12.7% on formula

feeding, 32.2% on cow milk, and 9.3% on mixed feeding. Our results also revealed that 47.5% of mothers complementary fed their infants before 4 months, while mothers who exclusively breastfeeding until 6 months were 11.2%, and mothers who complementary fed their infants 4-6 months were 41.3% which is similar to Wenge et al⁽⁸⁾. Median age of introduction of solid food was 11 weeks. In another study carried out by Gad et al⁽⁹⁾ in Ismailia city-Egypt on 377 infants, breast feeding infants were (80.1%) but not exclusively. Mothers who started weaning before 6 months were (65.8%) and weaning after 6 months was (21%), while (13.2%) was unknown. The results revealed that 22.2% of mothers began with yoghurt and cow milk which were different from Wenge et al⁽⁸⁾. Who found that commercially prepared cereals were the type of food started with at complementary feeding. Our results revealed the causes of early complementary feeding before 4 months was: i) the community thoughts, working mothers, working mothers who spend long time in their work, to grow babies faster, high cost artificial formula and scanty breast milk.

Table 5: Causes of early complementary feeding before 4 months in studied infants

Causes	n=169
Scanty breast milk to compensate insufficient breast milk	7 (4)
High cost artificial formula	13 (7.7)
Working mothers	45 (27.3)
Community thoughts (to grow rapidly and gain weight).	40 (23)
Community thoughts (to prepare infants to eat ordinary food as grown-up kids).	64 (38)

Table 6: Relationship between age at starting complementary feeding and weight in studied infants

Weight	Age when introduced to solid food (in months)				P- value
	Total n =418	< 4 months	4 – 6 months	> 6 months	
Normal Weight	366 (87.6%)	146 (40%)	135 (36.9%)	23 (6.3%)	< 0.001
Over weight	15 (3.5%)	10 (66.7%)	4 (26.7%)	1 (6.6%)	
Under weight	37 (8.9%)	13 (35.2%)	8 (21.6%)	16 (43.2%)	

Table 7: Frequency between age at starting complementary feeding and gastrointestinal illness, respiratory illness, atopic dermatitis, mouth ulcer and (vitamin D deficiency manifestations, pallor) in studied infants

	Onset of complementary feeding		
	< 4 Group (1)	4 -6 Group (2)	>6 Group (3)
Gastro-intestinal illness			
No=126	49(38.9)	66(52.4)	11(8.7)
Yes=230	120(52.2)	81(35.2)	29(12.6)
Total	169	147	40
Recurrence case n=140/230 (60.9%)	103(73.6%)	30(21.4%)	7(5%)
Respiratory illnesses			
No=181	36(19.9%)	109(60.2%)	36(19.9%)
Yes=175	133(76%)	38(21.7%)	4(2.3%)
Total	169	147	40
Recurrence case n=114/175 (65.1%)	102(89.4%)	10(8.8%)	2(1.8%)
Atopic dermatitis			
No=105	39(37.2%)	42(40%)	24(22.8%)
Yes=251	130(51.8%)	105(41.8%)	16(6.4)
Mouth ulcer			
No=222	69(31.1%)	121(54.5%)	32(14.4%)
Yes=134	100(74.6%)	26(19.4%)	8(6%)
Recurrence case n=121/134(90.3%)	92(76%)	26(21.6)	3(2.4%)
Vitamin D deficiency manifestations, pallor			
No=248	139(56%)	109(44%)	0(0%)
Yes=108	30(28%)	38(35%)	40(37%)

However, according to Wenge et al⁽⁸⁾, the most common cause was mothers wish to reduce nights feeds in order to get a longer time to sleep. Wright et al⁽¹⁰⁾ showed that the majority of mothers introduced solid food before 3 months due to their feelings that their babies were hungry or because the baby was not sleeping through the night. Our study revealed that (69.7%) of the infants eat adequate amount of food, (30.3%) eat inadequate amount, the causes of inadequate of feeding were: food refusal (30.3%); of those 7% of the infants refuse feeding by crying, 19% by refusing to open their mouth, 12% by accumulating food in their mouth, 10% by pushing food away, 18.5% by gagging reflex and 33.5% by vomiting. In addition, 24.2% of infants eat limited variety of food while 75.8% eat unlimited variety of food. Our results showed that the incidence of faulty CF was (58.7%), mothers who

introduced complementary feeding before 4 months were (47.5%), their infants were more exposed to gastrointestinal illness, respiratory symptoms, atopic dermatitis, and mouth ulcer, than infants who started 4-6 months, and after 6 months. Infants started after 6 months were more exposed to underweight and manifestations of pallor and vitamin D deficiency. Gad et al⁽⁹⁾ showed that the prevalence of feeding problems in the studied infants was 28.1%. Moreover, there was higher frequency of feeding disorders in infants weaned after 6 months. The most frequent type of feeding problems were eating small amounts of food (43.4%), eating non-nutritional foods (33%), and slow eating (15.1%). Gastrointestinal illness was observed in 65% of infants; more than half of them (52.2%) were those who started complementary feeding before 4 months of age as reported previously⁽¹¹⁾. The

prevalence of respiratory illness in the complementary-fed infants was (49.2%). The majority of infants who started CF <4 months was (76%) of infants having respiratory illness. Similarly to Kramer et al⁽¹²⁾ The prevalence atopic dermatitis was (70.5%) of the studied complementary fed infants, the majority of infants who started CF < 4months was (51.8%). Similarly to Zutavern et al⁽¹³⁾ The prevalence of mouth ulcer was 37.6% of studied complementary fed infants, the majority of infants who started CF < 4months was (74.6%). The prevalence of (vitamin D deficiency, pallor) was 30.3% of studied infants, the majority of infants who started CF after 6 months was (37%). Similar results were concluded by Mary et al, who conducted their research in Mexico and reported that exclusive breastfeeding after 6 months of age, was associated with increased risk of anemia at 9 months⁽²⁾ The prevalence of studied infants who were underweight was (8.9%) of total population. The majority of infants were complementary fed after 6 months was (43.2%). The prevalence of studied infants who were overweight was (3.5%). The majority of infants were complementary fed before 4 months (66.7%), this is in accordance with the results published by Wenge et al⁽⁸⁾.

Conclusion

Introduction of food before 4 months of age lead to significant high incidence and more recurrent attacks of gastrointestinal illness, eczema, respiratory illness, mouth ulcer, malnutrition and higher incidence of overweight. Introduction of food 4-6months of age lead to less incidence of gastrointestinal and respiratory illness, atopic dermatitis, mouth ulcer.

Introduction of food after 6 months of age result in significance risk of underweight and vitamin D deficiency and pallor manifestation.

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