

**INFLUENCE OF MATERNAL AGE ON MILK COMPOSITION
AND INFANT MALNUTRITION IN SHARKIA**

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ABSTRACT: In this study it was found that there were 13, 71, 16% of nursing women at ages below 20, 20-30 and over 30 years respectively. It was found that maternal age affected the chemical composition and energy density of breast milk. So, it can be recommend that mothers delivery ages must neither below 20 nor over 35 years. Also, it was observed that there were a considerable percentage of infants suffering from malnutrition. This problem requires the production of low cost supplementary foods to be introduced in infant feeding beyond the first 6 months of life.

INTRODUCTION

Human milk is a very complex fluid containing lipids, proteins, carbohydrates (lactose), and salts. knowledge of its composition is essential to adequate management of infant feeding. Fats in addition to providing more than 50% of the milk energy density are an essential nutrient for the development of the central nervous system and a vehicle for absorption of fat soluble vitamins (Jensen, 1999). Proteins provide infants with essential amino acids and nitrogen for growth of lean

body mass and for protein synthesis (Bellomonte *et al.*, 1990).

The report about growth of exclusively breast feed infants are scarce and there is no agreement about the time in which breast milk alone can support adequate growth. Some authors stated that breast feeding provides all the required nutrients in the first 2-3 months of life but fails later on to support adequate growth in the majority of cases (Waterlow and Thomson, 1979 and Waterlow *et*

al., 1980). Others suggested supplementary breast feeding at a late age than the one suggested by comparing the growth rate with the currently used reference curves (Juez *et al.*, 1983 and Whitehead and Paul 1984). Perez-Escamilla *et al.* (1995) showed that mothers body weight and fattiness are associated with infant birth weight which is in turn strongly related to both milk volume and milk energy intake. They added that maternal fattiness is positively associated with milk energy density.

In Egypt, prolonged breast-feeding is widespread in most socioeconomic groups and semi-solid foods do not appear to be introduced until late in the first year of life. El-Masry *et al.* (1967) and El-Taliawy (1976) reported that a quite high percentages of infants and children were considered among cases suffering malnutrition in Alexandria Governorate.

The aim of this work was to study the influences of maternal age on the chemical composition, and energy density of human milk as well as infant malnutrition cases in Sharkia Governorate.

MATERIALS AND METHODS

Human milk samples:

100 milk samples were collected from women at Zagazig mother and child care center and some Countryside health units. The donors were interviewed for their age. The infants ages and weights were also recorded.

About 0.1 ml of 1% potassium dichromate was added the milk samples before storage at freezing temperature.

Chemical analysis:

Fat content of milk samples was determined according to the BSI (1955).

Protein determination was carried on using kjeldahel method as shown by (AOAC, 1980).

Lactose contents were measured as given by Barnett and Abdel-Tawab. (1957).

Ash content was determined according to (AOAC, 1980).

Energy density of milk was calculated according to Garza *et al.* (1985).

The assessment of malnutrition in the examined infants was carried out according to WHO (1983).

RESULTS AND DISCUSSION

Mothers age:

It is evident from (Table 1), that 13% of the nursing women samples aged less than 20 years. Most of those young women (11%) lived in the rural area. The same table also shows that 71% of the nursing women were 20-30 years old. Most of those women were from the urban area (38%) while 33% of them lived in the rural area. Moreover, there were 16% of the nursing women samples at ages over 30 years. Most of them (10%) lived in the urban area. While 6% lived in the rural area.

Milk composition:

The fat, protein, lactose and ash contents of breast milk from nursing women at different age ranges were examined. Also, the energy density of those women milk was calculated.

Fat contents:

It is evident from results given in (Table 2), that milk fat of women at ages below 20 years to 25 years ranged from 3.4 to 3.50%. It had been increased up to 4.6% with the increase of mother's age up to 30 years, then decreased to 3.2% with the advance of mother's age over 35 years. These results are in quite agreement with those

of McDoniel *et al.* (1989). They reported that milk fat decreased as maternal age increased.

Protein contents:

As shown in (Table 2), the protein percentage of breast milk of mothers at age below 20 years was 1.13%. This value had been increased up to 1.50% with the increase of mother's age up to 25-30 years and remained unchanged with the advance of mothers' age over 35 years.

Also, the protein per grams in 100 k. Calorie of the milk energy was calculated. It was observed that its value in breast milk of young mothers was 1.72 gram/100 k. Calorie; then rose up gradually to 2.26 gram protein per 100 k. Calorie with the increase of mothers' age over 35 years.

Lactose contents:

Data in (Table 2), reveals that lactose contents in maternal milk increased slightly with the increase of mother's age from less than 20 years to over 35 years (7.00 to 7.08% respectively).

Ash contents:

Ash percentage of maternal milk from mother's ages below 25 years ranged from 0.17 to 0.19% (Table 2). These values rose up to

0.26% with the advance of mother's age up to over 35 years.

Energy density:

The energy provided by 100 ml of milk is known as the energy density. The lowest energy value reported in this study was 67.48 k. Calorie for breast milk from mothers with ages below 20 years. This value had been increased up to 81.13 k. Calorie with the increase of mother's age up to 30 years; then decreased gradually to 68.20 k. Calorie as the age of mother's increased over 35 years.

Infant malnutrition:

It is clear from (Table 2), that 71.43% of infants delivered by mothers at ages below 20 to 25 years suffered from malnutrition. This percentage dropped down to 50% when maternal age had been increased up to 30 years; then rose up again to 62.5% and 100% at maternal ages of 35 years and over this age respectively.

According to the recommendations of FAO, WHO and UNU (1985) a 6 weeks and 4 months infant require 116 and 99 k. Calorie (Kg/ day) and 2 and 1.5 g protein / (Kg/ day) respectively.

Using the calculated energy density for milk samples for mothers at different ages (Table 2), it was found that 143 to 172 and 122 to 145 ml breast milk (Kg/day) can meet the above energy and protein levels required for 6 weeks and 4 months infants respectively. Hence, the high percentages of infants suffering malnutrition observed in this study (Table 2) indicate that mothers milk volume and/ or energy density of most examined mothers could not meet the nutrition demands of those infants and they requires supplementation particularly infants of too young and old mothers beyond the first 6 months of infants life.

Waterlow and Thomson (1979) and Waterlow *et al.* (1980) noticed that breast feeding failed to support adequate growth in the second 6 months of infants life. Whitehead and Paul., 1984, Dewey *et al.* (1992) and Diaz *et al.* (1995) stated that exclusive breast fed infants may require supplementation beyond the 6 months of life and should not be recommended routinely before that time.

Table (1): The frequency distribution of nursing women ages in Sharkia Governorate.

Mother age range	Location (%)		Governorate (%)
	Rural	Urban	
Less than 20 years	11	2	13
> 20- 25	23	24	47
> 25- 30	10	14	24
> 30- 35	5	9	14
> 35	1	1	2
Total	50	50	100

Table (2): The effects of mother's age and milk composition on infant malnutrition.

Properties	< 20 years	> 20- 25	> 25- 30	> 30- 35	> 35
Fat %	3.4	3.5	4.6	3.6	3.2
Protein %	1.13	1.32	1.50	1.50	1.50
Protein/ 100 k. Calorie	1.72	1.94	1.90	2.15	2.26
Lactose %	7.00	7.03	7.05	7.05	7.08
Ash %	0.19	0.17	0.23	0.25	0.26
Energy density k.Cal/ dl.	67.48	69.95	81.13	71.76	68.20
Infant malnutrition. %	71.43	71.43	50.00	62.5	100

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تأثير عمر الأم على تركيب اللبن وحالات سوء التغذية عند الأطفال الرضع بالشرقية

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تشير نتائج هذه الدراسة إلى أن ١٣٪ من الأمهات المرضعات لم تتجاوز أعمارهن ٢٠ عاماً بينما ٧١٪ كانت أعمارهن من ٢٠ إلى ٣٠ سنة كما كانت هناك نسبة ١٦٪ من الأمهات تزيد أعمارهن عن ٣٠ سنة وقد لوحظ أن غالبية الأمهات الصغيرات من الريف بينما الأمهات التي تزيد أعمارهن عن ٣٠ سنة من الحضر وقد كان لعمر الأم تأثير واضح على كل من التركيب الكيميائي للبن ومحتواه من الطاقة.

ومن جهة أخرى وجد أن هناك نسبة ليست بالقليلة من حالات سوء التغذية بين الأطفال الرضع ويلزم للتغلب على هذه المشكلة إنتاج أغذية معونة لتغذية الأطفال بعد الشهر السادس مع الرضاعة الطبيعية.