Breast feeding and asthma in children in Diwanyiah

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Background: the protective effect of and the association between breastfeeding and asthma has raised substantial interest and is a subject of debate.
Objectives: to study the relationship between asthma and feeding pattern in children up to the age of 12 years in Diwaniah, Iraq with a focus on breast feeding.
Patients and methods: this is a prospective study accomplished in the maternity and children teaching hospital in Diwaniah ,Iraq during the period from January 2015 to March 2016. The study involves 1242 patients with the diagnosis of asthma and control group of 1350 healthy infants and children were chosen for comparison. The pattern of feeding and the period of breast feeding in both groups were recorded together with other variables.
Results: sixty six percent(688 out of 1041) of patients with asthma ≤ 5 years were artificially fed and only 13.5% of them were breast fed. the rate of asthma is significantly less in children with breast feeding especially when the age interval under five years is taken into consideration.
Conclusion: early, exclusive and prolonged breastfeeding protects against asthma in children particularly in those less than 5 years of age.

Introduction

Despite the fact that the cause of asthma in children has not been clearly determined, the following factors including exposure to certain environmental constituents and constitutional biologic and genetic predispositions has been blamed (1). In the susceptible host, several factors including immune reactions to usual respiratory exposures (e.g. respiratory viral infections , pollens, smoke of tobacco, air pollution) can initiate chronic, pathological inflammation and abnormal healing of inflamed tissues of the airways. In early infancy, recurrent episodes of wheezing are related to certain viruses of the respiratory tract , particularly common cold rhinoviruses, parainfluenzavirus, respiratory syncytial and adenovirus.

Asthma is a one of the most common and chronic diseases, causing significant morbidity. In the U.S ,Male sex and living in low socioeconomic status are demographic factors that increase the risks for acquiring asthma in children. The rate of asthma in children from families whom their incomes are less than $25,000 per year, was found to be 15 % in boys and 13% of girls; and 18% of all children from poor families, in comparison to 12% of children in families with better socioeconomic conditions . Asthma in children is one the most frequent causes of pediatric emergency department visits, hospital admissions , and absence from school. Worldwide, the prevalence of childhood asthma is increasing ,in spite of significant improvements in the care and treatment of asthma.(3)

Asthma is a common health problem in children in Diwaniah (180 km south of Baghdad, Iraq) due to the agricultural nature of the city. Asthma constitute more than 40% of admissions to the emergency ward in the maternity and children teaching hospital in Diwaniah (the main pediatric hospital in the city).(4)

the preventive effect of feeding from breast on occurrence of asthma has created a fundamental debate, but the scientific background that support this fact is controversial [5,6]. Several studies showed evidence of a negative relation consistent with preventive effect [7-14], other studies revealed either no relationship [15,16], or a convincing relationship between the period of breastfeeding and the chance of the

development of asthma [17,18].Friedman and Zeiger [5] concluded in their research that sole breast feeding had be enhanced for a period of at least 4 - 6months.

The objectives of our study was to determine the relationship between asthma and breast feeding in infants and children up to the age of 12 years in Diwaniah.

Patients and methods

This is a prospective study accomplished in the maternity and children teaching hospital in Diwaniah during the period from January 2015 to March 2016 , the study covered patients with asthma admitted to the emergency unit and the wards of the hospital in addition to the outpatient clinic of the hospital. Asthma was outlined as self-reported and physician diagnosed. The following parameters were included in the study: age, sex, residence(rural or urban), parent's education, exposure to environmental tobacco smoke (ETS), atopy and asthma in the parents. Paternal asthma and atopy were outlined as a doctor diagnosis of asthma or allergic rhinitis in one or both of the father and mother . A group of 1242 patients with the diagnosis of asthma were included in this study , their ages ranges between less than 6 month s to 12 years. The pattern of feeding and the total period of breast feeding was also recorded. A control group of 1350 healthy infants and children were chosen for comparison , those were selected from healthy infants and children attending the vaccination unit in the hospital and the outpatient clinic for mild illnesses. They were of a comparable age and gender .Statistical analysis was done using the chi square and unconditional logistic regression models , a P value of 0.05 was regarded to be statistically significant.

Results

During the study period (January 2015 to March 2016), 1242 patients with the diagnosis of asthma were admitted to the emergency unit, the wards of the hospital and attend the consultation clinic in the maternity and children hospital, 683 were males (55%) and 559 were females (45%) ,869 were from urban areas (70%) and 373 were from rural areas (30%). The parents education is summarized in table 1.

Table 1

education	Number	%
Illiterates	60	4.8
Primary school	625	50.3
Secondary school	476	38.3
university	81	6.6

The parents education of the study group

Considerning the exposure to environmental tobacco smoke(ETS), 870 of the patients were exposed to ETS (70%) and the remaining 372 had no history of exposure (30%). History of paternal atopy and asthma was reported in 311 patients (25 %) and was absent in 931 (75%).

Concerning the pattern of feeding , the first group of patients who were under six months of age were mostly artificially fed (40, 60.6%), those between six and twelve months (205, 67.2%). The pattern of feeding and asthma in the study group is summarized in table 2

Table 2

Age	Pattern of feeding	Patients		Control		P
		N	%	N	%	
< 6 months	Breast feeding	12	18.2	38	44.2	0.001
	Artificial feeding	40	60.6	30	34.9	
	Mixed	14	21.2	18	20.9	
6 - 12 months	Breast feeding	35	11.5	172	54.6	<0.001

	Artificial feeding	205	67.2	120	38.1	
	Mixed	65	21.3	23	7.3	
1 - 2 years	Breast feeding	35	10.7	202	58.0	<0.001
	Artificial feeding	216	66.3	112	32.2	
	Mixed	75	23.0	34	9.8	
2-3 years	Breast feeding	18	8.7	142	65.7	<0.001
	Artificial feeding	167	81.1	62	28.7	
	Mixed	21	10.2	12	5.6	
3-5 years	Breast feeding	40	29.0	64	43.2	0.037
	Artificial feeding	60	43.5	48	32.4	
	Mixed	38	27.5	36	24.3	
5-7 years	Breast feeding	49	32.7	70	37.6	0.601
	Artificial feeding	63	42.0	75	40.3	
	Mixed	38	25.3	41	22.0	
7 -12 years	Breast feeding	18	35.3	15	29.4	0.688
	Artificial feeding	16	31.4	20	39.2	
	Mixed	17	33.3	16	31.4	

Discussion

From the results of the present study one can conclude that the frequency of asthma is significantly less in children with breast feeding especially when the age interval under five years is taken into consideration. This is in accordance with several other published articles dealing with the relationship between the risk of developing asthma and breast feeding. One of the studies found that breast feeding for a period exceeding 16 weeks had significantly a lower rate of asthma at the age of three – eight years (Rust *et al*).(19) Added to that, the present study goes with the outcome of reviews dealing with cross sectional studies taking the relationship between asthma and breast feeding as a research aim (Hartert and Peebles,)(20). Some studies described that breast feeding may be protective against asthma even if there is a history of allergy in the family (19). Two studies demonstrated a less rate of wheeze in children who were breast fed but this association stands till the age of two years (19). In contradiction to our results, Sears *et al* showed that breast feeding could be a risk factor, rather than being preventive, for the development asthma, and the association was seen in children till the age of 9 years of age (21); however, this study classified the children into two groups, those with less than 4 weeks and those with more than 4 weeks of breast feeding and was retrospectively done which may bring a conclusion of contradicting results. Some authors failed to demonstrate a relation between family history of asthma and the protective effect against asthma (22); whereas other studies demonstrated an important preventive effect of breast feeding in children with a negative history of allergy in the family than those with positive family history (19). Some literatures suggested an interaction among breast feeding, gender and asthma rate (23). In other published articles, a low and high risk of sensitization has been reported in children with breast feeding compared with artificially fed children (24). Wright *et al* described a low level of IgE in the serum of children with breast feeding whose mothers serum IgE is also low; however, no such finding was observed in children whose mothers with high serum IgE (25). As it is a fact that breast fed infants has been seen to be have a less frequent early respiratory infections (26), the described relationship between asthma and breast feeding at early infancy could be due to the preventive effect of breast feeding against respiratory tract

infections. On the other hand, the symptoms of dyspnea and wheezing in children of 5 years of age together with their treatment by inhaled steroids are indicative of the presence of asthma rather than of respiratory infections. Several theories have been suggested to interpret the low risk of asthma in children with breast feeding . Breast milk is suggested to comprise a certain agents with a immunomodulatory effect that modify the evolution of the immune system in infant. Other well known hypothesis is that breast feeding activate the ripening of the underdeveloped mucosa of the intestine of the neonates and that breast fed infants had a better differential intestinal microflora in comparison with infants feeding from formulas, and that can effect the development of the primitive immune system (19).

This study concluded that breast feeding is correlated with a low risk of asthma in children up to 5 years of age.

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