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Comparison of Frequency of Atopic Dermatitis in Formula Fed and Cow's Milk Fed Children

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ABSTRACT

Objective: To compare the frequency of atopic dermatitis between formula and cow milk fed children between 1-5 years. **Study design:** It was a cross-sectional, comparative study. **Place of study:** Outdoor Departments of Pediatrics and Dermatology, DHQ and Allied hospitals, Faisalabad. **Period of study:** From January 2015 to December 2015. **Methodology:** Total one hundred and seventy-five patients of either sex between the ages of 1-5 years on nonexclusive breast feeding were included. Children having asthma and food allergy are excluded. Atopic dermatitis was diagnosed by clinical examination. Data was collected through specially designed proforma. **Results:** Out of 175 patients, mean age was 3.02±1.28 years. Majority of children (56.57%) had age range between 1-3 years. 107 (61.14%) patients were male and 68 (38.86%) patients were females. 85 (48.57%) children fed cow's milk while 90 (51.43%) children fed formula milk. The frequency of atopic dermatitis in formula milk fed children was found in 8 (8.89%) children and in cow milk fed children it was 17 (20%) children. P-value was 0.035 showing significant difference.

Conclusion: Children who were fed on cow's milk were more prone to develop atopic dermatitis.

Keywords: Atopic dermatitis, children, asthma, food allergy.

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INTRODUCTION

Atopic eczema, a common, relapsing inflammatory skin disease, characterized by pruitis. Over past three decades, the prevalence of atopic eczema has increased dramatically. About 50% of children in the first year of life presents with atopic eczema so it has become a major health problem in many industrialized nations of the world.[1,2]

Human milk is the optimal source of nutrition for infants during their first six months of life. Breastfeeding is strongly recommended by medical professional organizations. WHO recommendation is exclusive breastfeeding for first six months of infant's life. Human breast milk has many benefits with respect to nutrition, protection from infectious diseases, gastrointestinal function and psychological well-being. Many researches suggest that breastfeeding provide protection against childhood inflammatory, autoimmune and malignant diseases.[4,5]

Breast milk has many important compounds such as α-tocopherol, β-tocopherol and prolactin.[5] These compounds increase immunity, degrade inflammatory products and decrease the sensitivity to the allergens.[6]

Due to various reasons some children are fed on artificial feeding or cow's milk.

So, we design a study to know which type of feeding is more prone to the development of atopic dermatitis in children. The aim of our study is to investigate which form of feeding has reduced the frequency of developing atopic dermatitis.

METHODOLOGY

Study Design: It was a cross-sectional, comparative study.

Settings: Outdoor department of pediatrics and dermatology, DHQ and Allied hospitals, Faisalabad-Pakistan.

Duration: From January 2015 to December 2015.

Methods: One hundred and seventy-five children of either sex between the ages of 1-5 years on nonexclusive breast feeding were included by using non-probability consecutive sampling. Children having other skin problems (such as psoriasis and scabies), asthma and food allergy were excluded. Children whose parents are not available for giving proper feeding history are not included in the study.

Atopic dermatitis was diagnosed by clinical examination according to UK refined Hanifin and Rajka diagnostic criteria for atopic dermatitis. According to this criterion, the child must have: an itchy skin condition (or parental report of scratching or rubbing in a child) with 3 or more of the following criteria: onset below age 2 years, history of skin crease involvement (including cheeks in children under 10 years), history of a generally dry skin, personal history of other atopic disease (or history of any atopic disease in a first degree relative in children under 4 years), visible flexural dermatitis (or dermatitis of cheeks/forehead and outer limbs in children under 4 years).

On the basis of feeding pattern, children were divided into two groups:

Group A: Children had cow's milk feeding.

Group B: Children had formula milk feeding.

Data was analyzed by using SPSS Version 21. Mean ± Standard Deviation was calculated for all quantitative variables like age. Frequency and percentages were calculated for all qualitative variables like gender, feeding pattern, living area, occupation of mother, income and atopic dermatitis.

RESULTS

A total of 175 cases fulfilling the inclusion / exclusion criteria were enrolled to determine the frequency of atopic dermatitis in children between 1-5 years of age on nonexclusive breast feeding and to compare frequency of atopic dermatitis between formula and cow milk fed children.

Table I shows the demographic characteristics of the patients. Age distribution of the patients showing that 99 (56.57%) were between 1 – 3 years and 76 (43.43%) were between 4-5 years with mean age 3.02±1.28 years. Out of 175 patients, 107 (61.14%) patients were male and 68 (38.86%) patients were females. 142 (81.14%) mothers were house wife while 33 (18.86%) mothers were working ladies. 66 (37.71%) children were living in rural areas and 109 (62.29%) children lived in urban areas. 29 (16.57%) parents had income between 2,000 – 5,000 rupees / month, 55 (31.43%) parents had income between >5,000 – 10,000 rupees / month, 60 (34.29%) parents had income between >10,000 – 30,000 rupees / month and 31 (17.71%) parents had income > 30,000 rupees / month.

Table II shows the distribution of feeding pattern among 175 children on nonexclusive breast feeding. 85 (48.57%) children were on cow's milk feeding and 90 (51.43%) children were on formula milk feeding.

Table III shows the distribution of atopic dermatitis among different feeding patterns. Out of 175 patients, 25 (14.29%) children had atopic dermatitis. In children who were on cow's milk feeding pattern, 17 (20%) had atopic dermatitis and on formula milk feeding pattern, 8 (8.89%) had atopic dermatitis with p-value = 0.035.

Table 1: Demographic characteristics (n = 175)

		Mean 3.02±1.28 years
Age	1-3 years	99 (56.57%)
	4-5 years	76 (43.43%)
Gender	Male	107 (61.14%)
	Female	33 (62.29%)
Occupation of mother	House wife	142 (81.14%)
	Working Lady	33 (62.29%)
Living area	Rural	66 (37.71%)
	Urban	109 (62.29%)
Income of parents (rs / month)	2,000 – 5,000	29 (16.57%)
	>5,000 – 10,000	55 (31.43%)
	>10,000 – 30,000	60 (34.29%)
	>30,000	31 (17.71%)

Table 2: Distribution of feeding pattern (n = 175)

Cow's milk fed	Formula milk fed
85 (48.57%)	90 (51.43%)

Table 3: Atopic dermatitis among different feeding patterns

Atopic dermatitis	Group		Total
	Cow's milk fed (n = 85)	Formula milk fed (n = 90)	
Yes	17	8	25
No	68	82	150

p-value = 0.035

DISCUSSION

Atopic eczema is a chronic pruritic inflammatory skin disease, which is associated with other allergic disease like asthma and allergic rhino conjunctivitis. Human breast milk contains a variety of substances like immunoglobulins, antimicrobial enzymes, leukocytes and many anti-inflammatory compounds like polyunsaturated long-chain fatty acids platelet-activating factor (PAP)- acetyl hydrolase, and interleukin 10 (IL-10). Many agonists and antagonists of infant immune responses, like CD-14 and toll-like receptor (TLR) signaling modulating factors are also found in breast milk.[6] Due to many reasons breast milk. In such cases the infant is fed on formula milk or cow's milk to reduce the risk of allergens. In a randomized double-blind trial from the Germen Infant Nutritional Intervention society infants offered formula milk had significantly less chances of developing atopic eczema as compared to those given cow's milk. [1,7] Many studies are done to evaluate formula and cow's milk to reduce the risk of allergies. This study was conducted to determine which type of milk (formula milk or cow milk) has decrease chances of developing atopic eczema in children 1-5 years of age. In our study, out of 175 cases, 99 (56.57%) were between 1-3 years and 76 (43.43%) were between 4-5 years, mean±sd was calculated as 3.02±1.28 years. 107 (61.14%) were male and 68 (38.86%) were females. Frequency of atopic dermatitis in children between 1-5 years of age on nonexclusive breast feeding was recorded as 25 (14.29%), comparison of atopic dermatitis between formula and cow milk fed children shows that out of 85 cases of cow's milk fed 17 (20%) and out of 90 cases of formula fed 8 (8.89%) cases had atopic dermatitis, p-value was calculated as 0.035 showing a significant difference. The results of this study are comparable to the research article published in Journal of Investigative Dermatology which shows prevalence of atopic dermatitis in children is 10.7%.[7] Regarding comparison of frequency of atopic dermatitis between formula and cow fed children, no statistics were available on internet or in any research magazine locally so a pilot study conducted in Pediatric OPD of Allied hospital Faisalabad showing that atopic dermatitis was observed in 20% of children who were exclusively breast fed and 80% of children who were

nonexclusive breast fed, 30% who were fed formula milk and in 50% of children who were fed with cow's milk.

In a selected group of 100 children with dermatitis (mean age of 16 months), Hill et al[13] reported that 27% developed symptoms, mainly urticaria and angio-edema, within 45 min after ingesting cow's milk. This represents the IgE-associated reaction. About half the children in this cohort showed gastrointestinal symptoms (vomiting and diarrhea) between 45 min and 20 h after ingestion. About 20% developed atopic dermatitis, respiratory symptoms or diarrhea after 20 h and up to several days after the ingestion of cow's milk.[13]

The World Health Organization currently recommends exclusive breastfeeding for the first 6 months and continuing to breastfeed, as well as introducing other foods, until 2 years of age.[14]

Our study proved that formula milk fed children have lesser chances of developing atopic dermatitis. Further studies are needed to specify which formula milk is associated with lesser risk of developing atopic dermatitis.

CONCLUSION

Children who were fed on cow's milk were more prone to develop atopic dermatitis.

REFERENCES

1. Lin HP, Chiang BL, Yu HH, Lee JH, Lin YT, Yang YH, et al. The influence of breast feeding in breast-fed infants with atopic dermatitis. J Microbiol Immunol Infect. 2017;1182(17):30103-2.
2. Fleischer DM. The impact of breastfeeding on the development of allergic disease [online]. Last updated on Aug 15, 2016. Available from: https://www.uptodate.com/.../the-impact-of-breastfeeding-on- the-development-of-allergic-disease.
3. Risch AC. Breastfeeding and atopic dermatitis. Pediatrics. 2012;130(3):461-2.
4. Saeki H, Furue M, Furukawa F, Hide M, Ohtsuki M, Katayama I. Guidelines for management of atopic dermatitis. J Dermatol. 2009;36(4):563-77.
5. Leung DYM. Allergic disorders. Atopic Dermatitis (Atopic Eczema). In: Kilegman RM, Behrman RE, Jenson HB, Stanton BF. Nelson textbook of pediatrics 19th ed. Philadelphia: Saunders. 2011 pp. 764-828.
6. Eilas PM, Steinhoff M. Outside-to-inside (and now back to outside) pathogenic mechanisms in atopic dermatitis. J Invest Dermatol. 2008;128(5):1067-70.
7. Esparza-Gordillo J, Marenholz I, Lee Y. Genome-wide approaches to the etiology of eczema. Curr Opin Allergy Clin Immunol. 2010;10(5):418-26.
8. Darsow U, Wollenberg A, Simon D, Taieb A, Werfel T, Oranje A. ETFAD/EADV eczema task force 2009 position paper on diagnosis and treatment of atopic dermatitis. J Eur Acad Dermatol Venereol. 2010;24(3):317-28.
9. Shaw TE, Currie GP, Koudelka CW, Simpson EL. Eczema prevalence in the United States: data from the 2003 national survey of children's health. J Invest Dermatol. 2011;131(1):67-73.
10. Stelmach I, Bobrowska-Korzeniowska M, Smejda K, Majak P, Jerzynska J, Stelmach W. Risk factors for the development of atopic dermatitis and early wheez. Allergy Asthma Proc. 2014;35(5):322-9.
11. Finch J, Munhutu MN, Whitaker-Worth DL. Atopic dermatitis and nutrition. Clin Dermatol. 2010;28(6):605-14.
12. Hill DJ, Firer MA, Shelton MJ. Manifestations of milk allergy in infancy: clinical and immunologic findings. J Pediatr. 1986;109(2):270-6.
13. World Health Organization [website] Exclusive breastfeeding. Geneva, Switz: World Health Organization; 2011. Available from: www.who.int/nutrition/exclusive_breastfeeding/en/.
14. Gdalevich M, Mimouni D, David M, Mimouni M. Breast-feeding and the onset of atopic dermatitis in childhood: a systematic review and meta-analysis of prospective studies. J Am Acad Dermatol. 2001;45(4):520-7.
15. Dattner AM. Breastfeeding and atopic dermatitis: protective or harmful? Facts and controversies. Clin Dermatol. 2010;28(1):34-7.
16. Lien TY, Goldman RD. Breastfeeding and maternal diet in atopic dermatitis. Can Fam Physician. 2011;57(12):1403-5.

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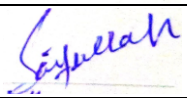
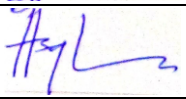
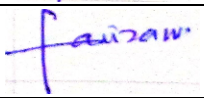
Dr. Saifullah Sheikh Assistant Professor, Pediatrics Faisalabad Medical University, Faisalabad	Data Collection and Writing	
Dr. Muhammad Asghar Butt Ex-Professor of Pediatrics Faisalabad Medical University, Faisalabad	Data Collection and Writing	
Faizaan Asghar Final Year MBBS Student King Edward Medical University, Lahore	Proof Reading and Statistical Analysis	
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