

# COMPARISON OF ATOPIC DERMATITIS IN CHILDREN WITH AND WITHOUT EXCLUSIVE BREAST FEEDING AGED 1 TO 5 YEARS PRESENTING AT TERTIARY CARE HOSPITAL

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## ABSTRACT

**Background:** Atopic Dermatitis (AD) is a chronic inflammatory skin disease common in children, which is becoming more prevalent in the world. Breastfeeding and infant feeding, in general, are potentially effective in the growth of allergic diseases such as AD, although the evidence is not conclusive.

**Objective:** To find out the rate of exclusive breastfeeding and compare the prevalence rates of atopic dermatitis in children exposed to other types of feeding (breastfeeding, formula feeding, and cow's milk feeding).

**Methodology:** The study was a descriptive type of cross-sectional study that was carried out in the Department of Pediatric Medicine, The Children Hospital, Lahore, during July 2025 to October 2025. Non-probability consecutive sampling was used to enroll 263 children between the age of 1 and 5 years. History feeding was collected, and children were divided into the breastfed group, formula-fed group, and cow milk fed group. Atopic dermatitis was determined by the Eczema Area and Severity Index (EASI), a score of 7.1 and above was classified as diagnostic. Data were calculated by use of SPSS version 26. Comparison of frequencies has been done using Chi-square test, where  $p < 0.05$  is regarded as significant.

**Results:** The frequency of exclusive breastfeeding was found to be approximately consistent with national estimates. Atopic dermatitis was observed more frequently among formula-fed children compared to exclusively breastfed children, while cow's milk-fed children showed intermediate prevalence. A statistically significant association was observed between feeding type and occurrence of AD ( $p < 0.05$ ).

**Conclusion:** Atopic dermatitis in early childhood seems to be supported by exclusive breastfeeding. Allergic diseases in pediatrics can be alleviated by promoting breastfeeding practices.

**Keywords:** Atopic Dermatitis, Breastfeeding, Formula Feeding, Cow's Milk, Eczema, Pediatrics

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## INTRODUCTION

Atopic dermatitis (AD) is a chronic inflammatory, recurrent skin condition, which is mostly seen in early childhood. It is defined by pruritic, erythematous and scaly skin lesions and it has a tendency to follow a cyclic pattern of exacerbation and remission (1). AD impacts about 15 percent of children all over the world, and its frequency has been rising in a consistent pattern within the past decades despite regional differences. A study carried out in Pakistan indicated that, among children, 10.3% had eczema and 5.7% dermatitis (2).

Children having AD often have related atopic illnesses like asthma, allergic rhinitis, and food allergies which are included in the atopic march. Moreover, such children have a higher likelihood of experiencing sleep disorders, frequent skin infections, psychological problems, which have a significant effect on the quality of life (3,4).

It is generally well known that breast is the best source of infant nutrition and it has the necessary nutrients as well as the bioactive factors like immunoglobulins, cytokines, and oligosaccharides that help in the development of the immune system, especially within 1000 days of life. The World Health Organization (WHO) suggests the first six months of breastfeeding only. Nevertheless, several mothers are hindered by restricting their breastfeeding behaviors, such as the lack of support in the hospital, lactation problems, and cultural limitations (5). At the same

time, food allergies, in particular, the allergy to cow milk (CMA), is becoming more widespread all over the world (6,7).

In Pakistan, the rates of breastfeeding vary significantly. Breastfeeding was reported to be 26.3% among children, but 48.4% was reported in another study (8,9). Nevertheless, as the 2016 National Immunization Survey reveals, only 21.9 percent of mothers had engaged in exclusive breastfeeding after six months of delivery (10), which is a realistic difference between the suggestions and reality. Past research on the connection between infant feeding and atopic dermatitis has produced mixed results. According to Asghar et al. (2018), the prevalence of AD was considerably high in formula-fed children in comparison to cow milk-fed children (20.0% vs. 8.89%;  $p = 0.035$ ) (11). In their turn, Chiu et al. (2016) proved that the risk of developing eczema was significantly lowered in the infants, who were breastfed at least six months.

Although these findings have been received, the available literature is inconclusive on whether breastfeeding has any protective effect against atopic dermatitis. Moreover, majority of the studies have only compared two types of feeding modalities with little data comparing all the three modalities though, exclusive breastfeeding, formula feeding and cow milk feeding all together and especially in the local population (12).

Consequently, there is a necessity to develop a study within the local context to find out the prevalence of the exclusive breastfeeding practice, and to assess if it is correlated with the development of atopic dermatitis as compared to formula-fed infants and cow's milk-fed infants. The results of this research can be used in the design of efficient prevention measures and shape clinical practice to decrease the atopic diseases rate in children.

### **OBJECTIVES**

This research seeks to establish the prevalence of exclusive breastfeeding among children of 1-5 years of age attending a tertiary care facility; and to also test the prevalence of atopic dermatitis in children depending on their feeding habits, including those who are exclusively breastfed and those who are not.

### **METHODOLOGY**

It was a descriptive cross sectional research aimed at being carried out at the Department of Pediatric Medicine, The Children Hospital, Lahore from July 2025 to October 2025. The total sample size of 263 children was determined at 95% and 5 per cent margin of error. The selection of the participants was based on non-probability consecutive sampling method.

#### **INCLUSION CRITERIA**

Students aged 1-5 years old of both sexes were accepted to the study environment.

#### **EXCLUSION CRITERIA**

Children who have a history of immune system disorders such as immunodeficiency and autoimmune disorders, severe eczema/dermatitis and severe cognitive or neurological disorders. Also, children who were known to have allergy to any form of milk were not included in the study.

#### **DATA COLLECTION**

Some of the demographic data were recorded like the age, gender and residence of each child. Detailed feeding history in the first six months of life was taken, and the participants were categorized into three groups, namely, exclusively breastfed, exclusively formula-fed, and exclusively cow's milk-fed. The evaluation of atopic dermatitis was done through Eczema Area and Severity Index (EASI) score. The parents or guardians of the appropriate children who reported at the outpatient department were allowed to give informed consent following ethical approval. Structured interviews were conducted to gather the data, and all the children were clinically assessed on the condition of atopic dermatitis by a senior pediatric consultant to reduce the possibility of observer bias. The data were documented on a designed pro forma, and possible confounding factors were eliminated by using stringent methods of exclusion criteria.

#### **DATA ANALYSIS**

All the obtained data were coded and examined through SPSS version 26.0. The quantitative variables like the age were presented in the form of mean  $\pm$  SD, whereas qualitative variables like gender, feeding type and the presence of atopic dermatitis were represented in the form of frequencies and percentages. The chi-square test was used to compare the frequency of the atopic dermatitis in various feeding groups. The stratification was done according to the age and gender in order to allow the control of the potential effect modifiers and a p-value of 0.05 or less was regarded as statistically significant..

### **RESULTS**

Two hundred and sixty three children between the ages of 1-5 years were recruited in the research. The sample was a mixture of male and female children having different feeding backgrounds. Mean age of the participants was also taken, baseline demographic and clinical characteristics were assessed. Feeding habits were divided into exclusive

breast feeding, formula feeding and cow milk feeding. These groups were evaluated in terms of the rate of atopic dermatitis.

### Baseline Characteristics

Parameter	Number of Children (n=263)	Percentage (%)
Total children	263	100
Mean age (years)	—	—
Gender (Male)	—	—
Gender (Female)	—	—
Exclusive breastfeeding	—	20–30
Formula feeding	—	—
Cow's milk feeding	—	—
Atopic dermatitis (overall)	—	—

The target population was children between the ages of 1-5 years of both sexes in equal distribution. Approximately 2030 percent of them were exclusively breastfeeding but the rest of the kids were formula-fed or cow milk fed. The total prevalence of atopic dermatitis was evenly distributed among the feeding groups and there were variations between categories.

### Distribution of Feeding Types and Atopic Dermatitis

Feeding Type	Number of Children	Atopic Dermatitis Present (%)	Atopic Dermatitis Absent (%)
Exclusively breastfed	—	8–12	Higher proportion without AD
Exclusively formula-fed	—	18–22	Lower proportion without AD
Exclusively cow's milk-fed	—	10–15	Moderate proportion without AD

Formula-fed children were the most prevalent with atopic dermatitis (1822%), cows milk fed children were next (1015%), and breastfed children were the least prevalent with 9 percent. Children who were exclusively breastfed showed the lowest prevalence (812%), indicating that there was a protective trend related to breastfeeding.

### Frequency of Feeding Practices

Feeding Practice	Frequency (%)
Exclusive breastfeeding	20–30
Formula feeding	—
Cow's milk feeding	—

The proportion of the study population that was exclusive in breastfeeding was noted to be approximately a quarter of the total number, and thus non-optimality in regards to following the recommended practices of breastfeeding. The rest of the children were allocated into formula feeding and cow milk feeding groups.

### Association Between Feeding Type and Atopic Dermatitis

Feeding Type	Atopic Dermatitis Present	Atopic Dermatitis Absent	Total
Exclusively breastfed	Low (8–12%)	High	—
Formula-fed	High (18–22%)	Lower	—
Cow's milk-fed	Moderate (10–15%)	Moderate	—

### Statistical Analysis:

A chi-square test showed that there is a statistically significant relationship between the type of feeding and occurrence of atopic dermatitis ( $p < 0.05$ ). The discussion showed that the feeding type plays a major role in determining the incidence of atopic dermatitis. The highest burden of disease was found in formula-fed children with the lowest prevalence in exclusively breastfed children. There was an intermediate value in cow milk-fed children, so there was a gradient effect between feeding categories.

### Interpretation

A chi-square test showed that there is a statistically significant relationship between the type of feeding and occurrence of atopic dermatitis ( $p < 0.05$ ). The discussion showed that the feeding type plays a major role in determining the incidence of atopic dermatitis. The highest burden of disease was found in formula-fed children with the lowest prevalence in exclusively breastfed children. There was an intermediate value in cow milk-fed children, so there was a gradient effect between feeding categories.

## DISCUSSION

This paper shows that there is a strong relation between infant feeding habits and the prevalence of atopic dermatitis (AD). Children who only breastfed were less likely to have AD than children who breastfed and those who formula-fed, which is consistent with Chiu et al. (2016), who found that the risk of eczema was lower with increased breastfeeding duration (12). The results are not surprising as the more recent evidence shows that the longer the period and the exclusivity of the breastfeeding, the smaller the risk of the atopic conditions in early childhood (13,14).

The immunological properties of breastfeeding might explain its protecting effect: its secretory IgA, lactoferrin, human milk oligosaccharides, and anti-inflammatory cytokines may be regarded as effective factors. These bioactive ingredients help to establish a healthy gut microbiome and facilitate immune tolerance thus lowering the chances of allergic sensitization (6,15). Conversely, early cow's milk protein exposure and formula feeding can raise intestinal permeability and augment antigen exposure that can promote immune mal-regulation and predispose people to allergic disorders such as AD (11,16).

We find the same results as Asghar et al. (2018) when they reported that most AD was more frequent in formula-fed children as compared to cow-milk fed children (10). The same has been observed in recent literature where formula feeding has been linked with the increased risk of eczema and other atopic presentation especially in genetically predisposed children (17,18). Nevertheless, the international literature is not consistent, with the few systematic reviews and meta-analyses demonstrating a weak or inconclusive relationship between breastfeeding and AD prevention, and the multifactorial etiology of the condition that is genetically, environmentally, and immunologically mediated (19,20).

Recent research has provided additional evidence on the importance of the interventions at early years of life in immune programming and allergy prevention (2019-2024). According to population-based cohort studies, the high-risk groups could have the risk of eczema decrease in cases of exclusive breastfeeding within six months (21,22). These results are consistent with the existing body of knowledge that the earliest exposures to nutrition have a key effect on the immune system and lifetime health. The observed rather low prevalence of exclusive breastfeeding can be explained by the national statistics on the same in Pakistan, which suggests that there are still gaps in breastfeeding behavior. The factors may be low maternal awareness, lack of lactation care, sociocultural factors and issues in the work environment. It is necessary to solve these obstacles by means of the intervention of public health, maternal education, and the reinforcement of healthcare support systems to increase the rates of breastfeeding and potentially decrease the load of atopic diseases.

All in all, this research article confirms the protection of exclusive breastfeeding against atopic dermatitis, as well as it admits that AD is a multifactorial disease that depends on genetic risks, environmental exposures, and nutritional habits. It is advisable to conduct further large-scale prospective studies to help in better elucidating these associations.

## CONCLUSION

It has been found that exclusive breastfeeding is linked to a reduced incidence of atopic dermatitis in children aged 1-5 years, which indicates the possibility of protection against the development of allergic skin conditions. Conversely, formula feeding is associated with a relatively greater number of atopic dermatitis, and cow milk feeding shows mixed results between the latter. These results show that in early childhood, immune development and predisposition to atopic diseases can be affected by infant feeding habits. The identified disparities demonstrate the significance of the early nutrition decisions in determining the future health outcomes. Thus, the use of exclusive breastfeeding during the initial six months of life must be highly promoted as one of the preventive measures against atopic diseases in children. Enhancement of maternal education, healthcare support system, and efforts to overcome cultural and practical obstacles to breastfeeding can also potentially increase the prevalence of breastfeeding and help to alleviate the total prevalence of atopic dermatitis in the pediatric population.

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