

## Effect of Breastfeeding in Childhood Asthma: A Tertiary Hospital Based Study

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### Abstract:

**Introduction:** Although breastfeeding protects the children from many adverse health conditions but controversy is still present regarding its role in the development of asthma and allergy. Many studies support a modest protective effect of breastfeeding against wheeze and asthma in infancy and early childhood. However, in later childhood (age 6 years and above) the protective effect of breastfeeding on asthma is less evident and there are some recent studies which suggest that breastfeeding actually increases the risk of asthma, wheeze or atopy to aeroallergens at older ages. Therefore a tertiary hospital based case control study has been proposed to find out the effects of exclusive breastfeeding on childhood asthma which is a highly prevalent disease in Sub-Himalayan Terai Region of North Bengal.

**Methods:** Patients of 3-12 years of age presented with asthma symptoms to our institute, were tested for reversibility (PEFR) and /or variability wherever feasible, were given anti-asthma drug trial and were followed up to observe the improvement and thus were diagnosed as childhood asthma excluding other differential diagnoses. In the present study, a total of 94 children with asthma were studied. After matching for age and sex 94 healthy children were included in the control group. History of breastfeeding in the asthma and control group was recorded.

**Results:** Among the asthma group 59.58% children were given exclusive breastfeeding (EBF) upto six months of age, 17.02% children were given artificial feeding (AF) and 23.40% children were given mixed feeding (MF). On the other hand in the control group 74.47%, 8.51% and 17.02% children were given exclusive breastfeeding, artificial feeding and mixed feeding respectively. So less number of asthma patients (59.58%) were exclusively breastfed in contrast to control group (74.47%), and the difference was statistically significant ( $\chi^2 = 4.72$ ,  $p = 0.0299$ ). The odds ratio for being asthmatics who were exclusively breastfed, compared to asthmatics who were not exclusively breastfed was found to be 0.51 (OR = 0.51, 95% CI = 0.27-0.94).

**Conclusion:** It is concluded that children living in this Sub-Himalayan Terai region of North Bengal have protective effect of breastfeeding on occurrence of asthma. In future long term multi-center large study should be carried out.

**Keywords:** Asthma, Breastfeeding, Childhood asthma, Exclusive breastfeeding

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### I. Introduction

Although breastfeeding protects the children from many adverse health conditions but controversy is still present regarding its role in the development of asthma and allergy. Many studies support a modest protective effect of breastfeeding against wheeze and asthma in infancy and early childhood.<sup>[1,2]</sup> However, in later childhood (age 6 years and above) the protective effect of breastfeeding on asthma is less evident<sup>[3]</sup> and there are some recent studies which suggest that breastfeeding actually increases the risk of asthma, wheeze or atopy to aeroallergens at older ages.<sup>[3-8]</sup> Another study suggests that breastfeeding is associated with increased risk of asthma only in children who have family history of atopic illnesses.<sup>37</sup> Recent data tells that breastfeeding might enhance the risk of asthma phenotypes and these are conflicting with public health guidelines encouraging breastfeeding and have raised concern among pregnant mothers and their doctors.<sup>[9, 10]</sup>

Therefore a tertiary hospital based case control study has been proposed to find out the effects of exclusive breastfeeding on childhood asthma which is a highly prevalent disease in Sub-Himalayan Terai Region of North Bengal.

### II. Materials and Methods

History and clinical examination findings were written in typed proforma in OPD and inpatient department after getting proper written consent from the guardians of the children. Proper permission from the ethical committee was taken before doing this study. Normal healthy children who are the neighbors of the patients were taken as control only after getting written consent from the guardians. This case control study was carried over one year (from 1<sup>st</sup> February, 2009 to 31<sup>st</sup> January, 2010) in the Department of Pediatrics, North

Bengal Medical College & Hospital. The drainage area of the study population is North Bengal Terai Region which includes Cooch behar, Jalpaiguri & Terai area of Darjeeling district in the state of West Bengal, India.

**Selection of cases:** Patients of 3-12 years of age presented to our department with clinical signs and symptoms of asthma were tested for reversibility (PEFR) and/ or variability wherever feasible, given anti-asthma drug trial and were followed up to observe the improvement and history of allergens and triggers were taken and thus diagnosed as asthma after excluding other important differential diagnoses. The Children presented with pulmonary symptoms which are due to any acute or chronic illnesses other than asthma were excluded from the study group. Patients having both asthma as well as any acute or chronic illness other than asthma were excluded from the study group.

**Selection of Control:** The healthy children (3 years to 12 years) who are neighbors of the patients visiting the OPD or inpatient department and who did not have any infections of respiratory tract or any pulmonary diseases or any known diseases which might impair pulmonary function and alter other parameters of the study, were included in this study after getting written consent. Any children having any kind of respiratory illness or any other illnesses which might affect the clinical and laboratory criteria of asthma were exclude from the study.

**Matching:** Matching of Sex: Male children were taken for male patients and female children were taken for female patients as controls.

Matching of Age: One healthy child who was within 3 -12 year age group and nearest to a patient by age was taken as his / her control.

### III. Results And Analysis

The collected data of breastfeeding among asthma and control was edited and entered into excel sheet 2010 Beta and analyzed by using SPSS version 16 software and Epi Info software. Findings were tabulated in frequency distribution table and the risk factor was analyzed by calculating exposure rate in cases and control group. Odds Ratio was also calculated for exclusive breastfeeding. Exposure rate of exclusive breast feeding of cases and controls was compared by using chi-square test. P value <0.05 was considered as significant statistically.

**Table 1: Pattern Of Breastfeeding Among Asthma And Control Group**

|       |                   |                | BREAST FEEDING |        |        | TOTAL  |
|-------|-------------------|----------------|----------------|--------|--------|--------|
|       |                   |                | AF             | EBF    | MF     |        |
| GROUP | ASTHMA<br>(n=94)  | Count          | 16             | 56     | 22     | 94     |
|       |                   | % within GROUP | 17.02%         | 59.58% | 23.40% | 100.0% |
|       | CONTROL<br>(n=94) | Count          | 8              | 70     | 16     | 94     |
|       |                   | % within GROUP | 8.51%          | 74.47% | 17.02% | 100.0% |
| TOTAL |                   | Count          | 24             | 126    | 38     | 188    |
|       |                   | % within GROUP | 12.77%         | 67.02% | 20.21% | 100.0% |

AF – artificial feeding, EBF – exclusive breastfeeding, MF – mixed feeding

Table no.1 shows that among the asthma group 59.58% children were given exclusive breastfeeding (EBF) upto six months of age, 17.02% children were given artificial feeding (AF) and 23.40% children were given mixed feeding (MF). On the other hand in the control group 74.47%, 8.51% and 17.02% children were given exclusive breastfeeding, artificial feeding and mixed feeding respectively. So less number of asthma patients (59.58%) were exclusively breastfed in contrast to control group (74.47%), and the difference was statistically significant ( $\chi^2 = 4.72$ ,  $p = 0.0299$ ). The odds ratio for being asthmatics who were exclusively breastfed, compared to asthmatics who were not exclusively breastfed was found to be 0.51 (OR = 0.51, 95% CI = 0.27-0.94).

### IV. Discussion

In the asthma group (N=94), 59.58% children were given exclusive breastfeeding (EBF) upto six months of age, 17.02% children were given artificial feeding (AF) and 23.40% children were given mixed feeding (MF). On the other hand in the control group 74.47%, 8.51% and 17.02% children were given exclusive breastfeeding, artificial feeding and mixed feeding respectively. So less number of asthma patients (59.58%), were exclusively breastfed in contrast to control group (74.47%) and the association of exclusive breastfeeding with asthma was found to be statistically significant ( $\chi^2 = 4.72$ ,  $p = 0.0299$ ).

In our study the risk of having asthma was less among exclusively breastfed children in comparison with the non-exclusively breastfed children and exclusive breastfeeding upto six month of age was found to be

protective (OR = 0.51, 95% CI = 0.27-0.94) and the chance of having asthma was found to be 1.98 times greater in non-exclusively breastfed children compared to exclusively breastfed children.

So the findings of our study is supported by some prospective studies<sup>[1,2]</sup> which reported modest protective effect of breastfeeding against wheeze and asthma in early childhood as in our study where majority of population was in earlier age group. In a study statistical significant relationship was found for breastfeeding where breastfed children having a 5.2-fold lower risk than those who were not breastfed (OR = 0.18, 90% CI = 0.05–0.75).<sup>[11]</sup>

In a study by Wright et al showed that children with asthmatic mothers were significantly more likely to have asthma if they had been exclusively breastfed (OR 8.7, 95% CI 3.4 to 22.2). This relationship was only evident for atopic children and persisted after adjusting for confounders. In contrast, the relation between recurrent wheeze and breastfeeding was age dependent. In the first 2 years of life exclusive breastfeeding was associated with significantly lower rates of recurrent wheeze (OR 0.45, 95% CI 0.2 to 0.9), regardless of the presence or absence of maternal asthma or atopy in the child. Beginning at the age of 6 years, exclusive breastfeeding was unrelated to prevalence of recurrent wheeze, except for children with asthmatic mothers in whom it was associated with a higher odds ratio for wheeze (OR 5.7, 95% CI 2.3 to 14.1), especially if the child was atopic.<sup>[12]</sup>

Elliot et al showed that breastfeeding was protective for wheeze in the first 3 years of life. They did not find consistent evidence for either a deleterious effect or a protective effect of breastfeeding on later risk of allergic disease in a large prospective birth cohort of children with objective outcome measures and extensive data on potential confounders and effect modifiers.<sup>[13]</sup>

In children without a maternal allergic history, the risk of allergic disease in general decreased progressively with longer duration of breastfeeding, being significant for those breastfed >12 months. In contrast, in children with maternal allergic history, no such decrease in risk was observed. A similar trend was observed for asthma, although not significant.<sup>[14]</sup>

Takemura, et al, investigated the relation between breastfeeding and the prevalence of asthma among a childhood population in Japan (age range, 6–15 years). The authors added supplementary questions on the parental history of asthma and feeding patterns from the age of 0–3 months. The risk of breastfeeding for asthma was compared with that of artificial feeding. After adjustment for age, gender, parental smoking status, and parental history of asthma, a significantly higher prevalence of asthma was noted among children who had been breastfed. The results indicated that breastfeeding in infancy might be related to the higher prevalence of asthma during preadolescence.<sup>[15]</sup>

So the protective effect of exclusive breastfeeding of our study can be explained by the fact that majority of our study population were in early age group and majority of the mothers exclusively breastfeeding their babies, were non-atopic.

## V. Conclusion

It is concluded that children living in this Sub-Himalayan Terai region of North Bengal have protective effect of breastfeeding on occurrence of asthma. In future long term multi-center large study should be carried out.

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