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Comparative analysis of asthma incidence between breastfed and bottle-fed children (aged 3-7 years old)

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Abstract. This study primarily aimed to compare the incidence of asthma between breastfed and bottle-fed children. And to determine if the demographic characteristics such as age, sex, ordinal position in the family and familial history of asthma affect the incidence of asthma as well. This study used Comparative-Survey Design through self-structured questionnaire given to the parents of the respondents who were the 3-7 year-old asthmatic children, selected through purposive sampling technique. The data gathered were then tabulated and analyzed using Chi-Square Method of Association. It was found out that most of the asthmatic respondents were between 5-7 years old which showed a high association between the age and the incidence of asthma. It implies that as the age increases, the incidence of asthma also increases. Results also showed that males are more likely to have high incidence of asthma than females. The incidence of asthma is likewise higher in eldest respondents than the middle or youngest. Moreover, there is a significant relationship between the familial history of asthma and its incidence. And finally, the feeding status of the respondents whether breastfed or bottle-fed during the first 6 months of life affects the incidence of asthma as the incidence is higher in bottle-fed than in breastfed respondents.

Key words: asthma incidence, breastfed, bottle-fed.

Introduction

Asthma is a common disease worldwide and, over the past two decades, is showing an increasing trend for all ages, sex and racial groups. Asthma involves the narrowing of the airways (bronchi) which lead from the windpipe into the lungs. The main symptoms of an asthma attack are difficulty in breathing, shortness of breath and a tight sensation around the throat. An audible wheeze is often heard and sometimes coughing can be the main symptom in children. The World Health Organization (WHO) estimates 300 million people around the world suffer from asthma with over 80% of asthma deaths occurring in low and lower-middle income countries. In the Philippines, an estimated 12% of the population, children and adults included, suffer from asthma (GlaxoSmithKline 2007). However, no one knows exactly what causes asthma and what the definite treatment is. Hence, an idea came into focus if the type of feeding the child received during infancy can somehow predispose to asthma during childhood.

In this study, the demographic characteristics of the respondents such as age, sex, ordinal position in the family and family history of asthma are also taken into consideration. According to Naspitz et.al (2001) the prevalence of asthma in boys has been shown to be twice as much as that of girls before the age of 14 years old. One hypothesized explanation for the excess of asthma seen in boys is the differing airway geometry. Boys have been

shown to have smaller airways for a given lung size than girls; lower flow rates in boys aged 4-6 years were found in addition to higher airway resistance in comparison with girls of the same age. This difference in airway anatomy could predispose boys to more wheezing and lower respiratory tract illnesses. On the other hand, according to the American Thoracic Society (2008) first-born children are at higher risk of developing asthma and allergy due to pregnancy conditions. And according to Burke et.al. (2003) and London et.al. (2001), family history of asthma and allergies strongly influences asthma risk in children.

Oddy et.al, (1999), investigated the association between the duration of exclusive breastfeeding and the development of asthma related outcomes in children at age 6 years. It was found out that there is a significant reduction in the risk of childhood asthma at age 6 years old if exclusive breastfeeding is continued for at least 4 months after birth. This finding was further supported by Fredriksson et.al. (2007) who found out that the prevalence of asthma is at its lowest when a child was breastfed 4 to 6 months after birth.

Meanwhile, Takemura, et.al, (2001) investigated the relation between breastfeeding and the prevalence of asthma among childhood population. The risk of breastfeeding for asthma was compared with that of artificial feeding. After adjustment for age, sex, 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 lead to the higher prevalence of asthma during preadolescence. Thus, Naspitz et.al. (2001) proposed that it is possible that maternal effects on the developing immune system may not be confined to the fetal period but could also act through breastmilk.

Materials and Methods

Research Design

This study used Comparative-Survey Research Design to compare the incidence of asthma between breastfed and bottle-fed children.

Population and sample

The target population in the study consisted of 60 asthmatic children aged 3 to 7 years old, from selected schools in Iligan City, Philippines that were selected through purposive sampling technique.

Instrument

A self-structured questionnaire was utilized in gathering the necessary data and information. The questionnaire had two parts. Part 1 determined the feeding status of the respondents either breastfed (fully breastfed for at least 6 months after birth) or bottle-fed (fed with infant formula since birth). Part 2 revealed the demographic characteristics of the respondents such as age, sex, ordinal position in the family and familial history of asthma.

Procedure

Clinically diagnosed asthmatic children between 3-7 years old were identified in the four selected schools in Iligan City, Philippines during the academic year 2011-2012 through their respective school clinic records. Then the self-structured questionnaires were

given/sent to the parents/guardians of the asthmatic children. The answered questionnaires were then collected and results were tallied and interpreted.

Data analysis

To describe the feeding status and demographic characteristics of the respondents, Frequency and Percentage distribution was utilized. And to determine if asthma incidence is associated to the feeding status and to the demographic characteristics of the respondents, Chi-square Method of Association and Fisher's exact test were employed.

Results and Discussion

Research question 1: What is the feeding status of the respondents as to breastfed or bottle-fed?

Table 1 shows that 65% of the respondents were bottle-fed and only 35% were breastfed for at least 6 months after birth. This implies that most of the asthmatic children surveyed were bottle-fed by their mothers or caregivers during infancy. This is in line with the finding of Dell et.al. (2001) that the risk of asthma and wheeze was approximately 50 percent higher when infants were formula-fed compared to infants who were breastfed for nine months or longer.

Table 1. Feeding Status of the Respondents (N=60)

Response	No. Of responses (%)	
Breastfed	21	(35.0)
Bottle-fed	39	(65.0)

Research question 2: What is the demographic characteristics of the respondents in terms of age, sex, ordinal position in the family and familial history of asthma?

Table 2. Demographic characteristics of the respondents (N=60)

Response	No. Of Responses (%)	
Age		
3	3	(5.0)
4	4	(6.6)
5	18	(30.0)
6	19	(31.7)
7	16	(26.7)

Mean=5

Sex		
Male	31	(51.7)
Female	29	(48.3)
Ordinal Position in the family		
Eldest	27	(45.0)
Second	7	(11.7)
Third	2	(3.3)
Fourth	5	(8.3)
Youngest	19	(31.7)
Familial History of Asthma		
Yes	53	(88.3)
No	7	(11.7)

Table 2 shows that majority of the respondents or 88.4 % fall on age group 5-7 years old with 6 year-olds as the highest with 31.7%. It implies that asthma incidence is more prevalent between 5-7 years old. Most of the respondents or 51.7% are males and 48.3% are females. This result is in line with Naspitz et.al. (2001) that the prevalence of asthma in boys has been shown to be twice as much as that of girls. Most of the respondents (45%) are eldest in the family. This finding agrees with the finding of the American Thoracic Society (2008) that first-born babies are at higher risk of developing asthma and allergy. Large number of respondents or 88.3 % have familial history of asthma. This shows that majority of the respondents have family members or relatives who have asthma. This agrees with the finding of Burke et.al. (2003) that a positive family history predicts an increased risk of asthma incidence.

Research question 3: Is there a significant relationship between the feeding status of the respondents (breastfed or bottle-fed) and the asthma incidence?

It was found out that 65% of the respondents are bottle-fed and only 35% are breastfed. This means that most of the asthmatic children surveyed were bottle-fed by their mothers/caregivers during infancy. With this, a chi-square test of association was done in order to determine if there is a significant relationship between the feeding status of the respondents and the asthma incidence.

Table 3. Test of significant relationship between the feeding status of the respondents (breastfed or bottle-fed) and the asthma incidence.

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	60.000 ^a	1	.000	.000	.000	
Continuity Correction ^b	55.685	1	.000			
Likelihood Ratio	77.694	1	.000	.000	.000	
Fisher's Exact Test				.000	.000	
Linear-by-Linear Association	59.000 ^c	1	.000	.000	.000	.000
N of Valid Cases	60					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.35.

b. Computed only for a 2x2 table

c. The standardized statistic is 7.681.

The result shows that there is a significant relationship between the feeding status of the respondents during infancy and the asthma incidence. This suggests that the incidence of asthma for bottle-fed children is higher than the breastfed children. This finding agrees with Fredriksson et.al. (2007) who found out that the prevalence of asthma is at its lowest when a child was breastfed 4 to 6 months after birth. And it contradicts with the finding of Takemura, et.al, (2001) that higher prevalence of asthma during preadolescence might be related to breastfeeding in infancy.

Research question 4: Is there a significant relationship between the demographic characteristics of the respondents (age, sex, ordinal position in the family and familial history of asthma) and the asthma incidence?

Testing of hypothesis was formulated with the use of Chi-square test of association in order to determine if there is a significant relationship between the demographic characteristics of the respondents and the asthma incidence. The asthma incidence is categorized as high if it is above 30 in terms of frequency. At 0.01 and 0.05 levels of significance, it was found out that there is a significant relationship between the profile of the respondents (age, sex, ordinal position in the family and familial history of asthma) and the asthma incidence.

Conclusion

The findings of the study have implications to health care providers and parents. The asthma incidence of the respondents has been associated to their feeding status during infancy as the incidence of asthma is higher in bottle-fed than in breastfed children. This is an indication that complete breastfeeding during the first 6 months of life exerts some protective effect against the development of asthma in early childhood. Other factors such as the demographic characteristics of the respondents such as age, sex, ordinal position in the family and familial history of asthma are also found to significantly influence the incidence of asthma. Hence, it is also important for parents to consider these factors in looking into the child's chances of having asthma and in taking preventive measures. Therefore, it is recommended that public health efforts should reinforce the promotion of breastfeeding as it is potential to improve the overall health status of the growing children.

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