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Original Article

Childhood Asthma and its Associated Factors Among Children Attending a Tertiary Level Hospital Kathmandu

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Abstract

Introduction: Childhood asthma is one of the most common non-communicable chronic pulmonary diseases of children and causes considerable morbidity. Prevalence of childhood asthma has grown dramatically in developed as well as developing countries. The objective of the study was to find out the factors associated with childhood asthma among children attending Kanti Children's Hospital, Kathmandu, Nepal.

Methods: Descriptive, cross-sectional study design was adopted and 152 parents were selected by using non probability purposive sampling technique. Data was collected using pre tested structured with an interview schedule after permission from concerned authorities. The data was analyzed by using descriptive and inferential statistic with SPSS IBM 16.

Results: The finding of the study revealed that various factors were associated with childhood asthma. Among child related factors, age of children 6 years and above (p-value = < 0.001, OR = 4.190, 95% CI: 1.814 - 9.678), absence of exclusive breast feeding (p-value = 0.021, OR = 2.14, 95% CI: 1.062 - 4.351), history of recurrent allergy and rhinitis (p-value 0.049, OR = 1.9117, 95% CI: .953 - 3.856) and influenza vaccine (p-value = 0.001, OR = 3.714 95% CI:1.691-8.157) and in maternal factors, history of asthma in mother (p-value = 0.002, OR = 13.662, 95% CI:1.729 - 107.994), and on environmental factors, presence of dampness at home (p-value = 0.001, OR = 3.7142, 95% CI: 1.5584 - 9.3408) were found to have significant association with childhood asthma.

Conclusions: It could be concluded that 50.7% of children were diagnosed as asthma. Several factors were associated with childhood asthma. Children age 6 years and above, lack of exclusive breast feeding, history of recurrent allergy and rhinitis and presence of dampness at home, maternal history of asthma and seeking of influenza vaccine were found significant association with childhood asthma.

Introduction

Asthma causes recurring periods of wheezing, chest tightness, shortness of breath, and coughing.[1] Globally 235 million people are currently suffering from asthma and mostly occur in low and lower-middle income countries.[2] Asthma and other respiratory diseases are becoming significant causes of school absence and this can lead to a reduction in scholastic performance. This trend has been seen both in western and in developing countries.[3] Most asthma begin in childhood, and a number of environmental and lifestyle factors contribute to the onset of asthma, which lead to a reduction in scholastic performance, these factors include outdoor and indoor pollutants.[3,4]

Several international studies have shown an increased prevalence of allergic respiratory diseases worldwide, particularly among children. Exposure to passive smoking, family history of asthma, people living in room without window and without adequate sunlight were proved to be significant risk factors.[5] Childhood asthma is more common on single parent family, poor living condition, exposure to tobacco and formula feeding babies.[6]

This study aimed to find out the associated factors of childhood asthma among three to 10 year children which will help to make awareness about various factors that will facilitate parents to protect from modifiable risk factors and intervention on these factors to reduce burden of disease at the community level.

Methods

A descriptive cross sectional study design was adopted to find out associated factors of childhood asthma among children attending in Kanti Children's Hospital, Maharajgunj, Kathmandu, Nepal after getting approval from research committee and verbal consent from the concerned authority. The study was conducted at the Out Patient Department (OPD) of Kanti Children's Hospital and total 152 children were included in the study meeting the inclusion criteria. The data was collected from 2nd September 2018 to 28th September 2018. Non-probability purposive sampling technique was used because of unavailability of complete patients' record in OPD register to select parents of children aged between three to 10 years, as this age group is more susceptible to develop asthma.[7] During sampling procedure, the age of the child was noted by checking the age of child on OPD ticket and validated it by asking the parents. Parents of children were explained the purpose of the study. Parents who had children below three years and above 10 years were excluded from study. Data was collected using face to face interview schedule by the researchers. Confidentiality of the respondents was maintained by keeping information in such a way that only researchers could assess them and was also assured that the information obtained would be used only for the study purpose. The data were edited, classified, coded and entered in the Statistical Package for Social Science (SPSS) version 16 for analysis. Data were analyzed by using descriptive (frequency, percentage, mean and standard deviation) and inferential statistics (chi square test and fisher exact test) to determine association of dependent and independent variables.

Results

Table 1. Socio – demographic characteristics of children

N = 152

Characteristics	Number	Percentage
Age in completed years		
3-5	115	75.7
and above 6	37	24.3
Mean age:4.872.17SD		
Sex		
Male	104	68.4
Female	48	31.6
Religion		
Hinduism	135	88.8
Buddhism	10	6.6
Christianity	5	3.3
Islamic	2	1.3
Types of Family		
Nuclear	87	57.2
Joint	65	42.8
(Residence (at least six months		
Urban	133	87.5
Rural	19	12.5
(If urban (n = 133		
Close to busy road	71	53.4
Away from busy road	62	46.6
Respondent at interview		
Mother	144	94.7
Father	8	5.3

Table 1 represents the socio-demographic characteristics of the enrolled children. Out of 152, majority (75.7%) of the children were of age group between three to five years. The mean age was 4.872.17. Regarding sex, more than half (68.4%) of children were male. Regarding the religion, majority (88.8%) of the children were Hindu. Similarly less than half (46.1%) of the children were from upper caste. More than half (57.2) of children were from nuclear family. Majorities (87.5%) of children were residing on urban area and among them half of them were living on close to busy road. Almost all (94.7%) of respondents were mothers.

Table 2 Health Problem of the Children

N = 152

Health problems	Number	Percentage
Asthma	77	50.7
Upper respiratory tract infection	40	26.3
Reactive airway disease	26	17.1
Multi trigger wheeze	9	5.9

Table 2 reveals the pediatrician diagnosed health problems of children. Among 152 children, half (50.7%) were diagnosed as asthma and remaining were recurrent cold and cough, reactive airway disease and multi trigger wheeze 26.3%, 17.1%, and 5.9% respectively.

Table 3. Child's factors related to childhood respiratory problem N = 152

Variables	Number	Percentage
Birth order		
First	79	52.0
Second	56	36.8
Third	10	6.6
Forth	7	4.6
Immunization status		
Basic (BCG, DPT/Hep/Hib, (polio, measles	152	100
Japanese encephilitis	138	90.8
Optional		
Influenza	41	27
Breast Feeding	152	100
Exclusive	85	55.9
Non exclusive	67	44.1
Total duration of breast feeding		
years 2 >	57	
years 2 <	95	
Allergy and rhinitis	69	45.4
Recurrent cold and cough	150	98.7
No of attack per year (n = (150		
times 10 >	108	72
and above 11	42	28
Childhood disease		
Pneumonia	56	36.8
Measles	15	9.9
Worm infestation	5	3.3
Tuberculosis	3	2
Whooping cough	1	7.

Table 3 shows that more than half (52.0%) of children were first born child. All of them had received basic immunization. Among them, 90.8% children received Japanese encephalitis and only one fourth children received influenza vaccine. All of them were breast fed children and more than half (55.9%) of them had received exclusive breast feeding. Nearly half (45.4%) of children had history of allergy and rhinitis and almost all (98.7%) had recurrent history of cold and cough, among them 28% children had more than 10 attacks per year. Regarding past infection, most of the children had no history of measles in past and almost all (99.3%) had no history of whooping cough. Similar data (98%) was seen on tuberculosis. One third of children had history of pneumonia in the past and only 3.3% of children had history of worm infestation in the past.

Table 4. Maternal factors related to childhood respiratory problem N = 152

Variables	Number	Percentage
Mode of delivery		
Vaginal	110	72.4
Caesarean section	42	27.6
Maternal smoking	21	13.8
Other members in family	51	33.6

Table 4 represents maternal factors related to childhood asthma. Majority (72.4%) of children were born via vaginal delivery. Majority (86.2%) of mothers were non- smoker but one third (33.6%) of other family member were used to smoke.

Table 5. Household Factors Related to Childhood Respiratory Problem N = 152

Variables	Number	Percentage
Dampness at home	38	25
Visible mold at home	19	12.5
Exposure to sunlight	115	75.7
Duration of sunlight exposure per day		
hours 2 >	33	28.7
hours 4 - 2	45	39.1
hours 5 <	37	32.2
Carpet used at home		
Dust trapping carpet	83	54.6
Plastic carpet	45	29.6
Bare floor	22	14.5
*Other	5	03.3
Ventilation status		
Double window	84	55.2
Single window	65	42.8
Ventilation only	3	o.2
Residence around Industrial area	5	3.3

*Other = hay mat, foam mat

Table 5 shows the household factors associated with childhood asthma. Dampness at wall or ceiling was present on one forth (25%) children's home. Mold was not present on majorities (87.5%) of houses. Sunlight entered on majority (95.7%) of houses. Regarding use of carpet at home, half (54.6%) of houses used dust trapping carpet and 14.5% of houses had bare floor. Regarding ventilation status, half of houses had two windows at room and very few (2%) had ventilation only. Almost all (96.7%) children's house had located in non- industrial area.

Table 6. Association between childhood asthma and associated factors

N =152

Variables		Asthma		Chi- square Value	OR (95%CI)	P-Value
		Yes n (%) (50.7)77	No n (%) (49.3)75			
Age	6 and above 3 - 5 years	28 (75.5) 49 (42.6)	9 (24.3) 66 (57.4)	12.246	4.190 (1.814 -9.678)	*0.001 >
Exclusive breast feeding	No Yes	41 (61.2) 36 (42.2)	26 (38.8 49(57.)	5.321	2.14 (1.062 - 4.351)	0.021*
History of allergy and rhinitis	Yes No	41 (59.4) 36 (43.4)	28 (40.6) 47 (56.6)	3.881	1.9117 (.953-3.856	0.049*
Influenza vaccine taken after respiratory problems	Yes No	30 (73.2) 47 (42.3)	11 (26.8) 64 (57.7)	11.384	3.714 (1.691-8.157	0.001*
Asthma in Mother	Yes No	12 (92.3) 65 (46.8)	1 (7.7) 74 (53.2)		13.662 (1.729-107.994)	0.002*#
Dampness present at home	Yes No	28 (73.7) 49 (43.0)	10 (26.3) 65 (57.0)	10.474	3.7142 (1.5584 - 9.3408)	0.001*

*P-value significant at < 0.05 level, CI = Confidence Interval, OR = Odds Ratio
fisher's exact test value

Table 6 represents that children aged six years and above were found to be significantly associated with childhood asthma (p-value = < 0.001). Similarly, significant association was found on exclusive breast feeding (p-value = 0.021). Children with recurrent history of allergy and rhinitis found to be significant association with childhood asthma (p-value = 0.049) and similar finding was found on influenza vaccine (p-value = 0.001). Children of asthmatic mother had significant association (p-value = 0.002) for development of childhood asthma, which was 13.6 times higher risk than non - asthmatic mother. In relation to father, there was five times more risk for asthma to their children. Similarly, presence of dampness at home had also significant association (p-value = 0.001) to develop asthma in children.

Discussions

The objective of the study was to find out the factors associated with childhood asthma among children attending tertiary level hospital.

Study findings revealed that various factors were associated with childhood asthma such as child related factors; parents related factors; and environment related factors. Regarding child related factors, the study findings revealed that children aged 6 years and above showed significant association with childhood asthma (p-value = < 0.001). Similar finding was found on study conducted by Arora K,[7] where more prevalence of childhood asthma was found in five to eight years age group compared to other age group (P = 0.001). The mean age of the children with asthma was 8.67 ± 2.62 years. Similar finding has been reported in study done in India that childhood asthma was higher among children six to seven years of age Pal et al.[8]

In relation to exclusive breast feeding, more than half (61%) of the children with asthma had not received exclusive breast feeding in their early life. So significant association is found on lack of exclusive breast feeding up to six months (p-value = 0.021) and (OR: 2.14; CI: 1.062-4.350. The finding is supported by Cheraghi et allndia","container-title":"International Scholarly Research Notices","genre":"Research article","abstract":"We aimed to

determine current prevalence of asthma and risk factors associated with it in Pune, India. Methods. This was a cross-sectional school-population-based study in which parents of school children aged 6-7 and 13-14 were administered an ISAAC questionnaire and an additional set of questions that detected the presence of potential risk factors known to be associated with asthma during 2008-2009 academic years. Results. Prevalence of current asthma was 6.7% (7% amongst 6-7-year olds and 6.3% amongst 13-14 year olds. Asthma was more common amongst boys (8.1%[9] where absence of exclusive breast feeding during first 6 month of life is significant risk factors for childhood asthma (p-value = < .005) and (adj. OR: 1.97;CI: 1.37–2.83). Breast feeding was most protective against wheezing and lower respiratory tract illness. Specific components in human milk have been suggested to promote the maturation of the immune system. This could be due to the immunological and nutritional benefits of human milk.

This study finding also revealed that children who had history of recurrent allergy and rhinitis had found significance association with childhood asthma, p-value = 0.049 (OR = 1.911, 95% CI .953-3.854). This study result is consistent with study by Dhakar et al[10] which reported that children who had allergy in the last 12 months were 3.50 (1.25- 9.83) times more likely to get disease compared to those did not have an allergy and rhinitis. In this study, significant association (p-value = 0.001) is found on influenza vaccine. Higher number of children who had diagnosed as asthma had received influenza vaccine than non - asthmatic children with respiratory problems. Present study showed that there was no significant association found (p-value = 0.490) between childhood asthma and mode of delivery. In contrast of this findings, Zhao et al[12] reported that children who had born via caesarean delivery had higher chance of having childhood asthma (OR = 2.853, 95% CI: 1.311-6.208). Potential reasons for these findings might be majority of children included in the study had born via vaginal delivery.

Regarding parents related factors in family history of childhood asthma, children of mother with asthma had significant association with childhood asthma (p-value- 0.002, OR = 13.662, 95% CI: 1.729-107.994). Similar finding was found on study conducted by Sahitoet al[11] reported that family history of asthma was significant (adj. OR 2.3, 95% CI: 1.3-3.9) for childhood asthma. Positive family history is one of the major criteria included in the asthma predictive index that is used to identify children with increased risk of developing asthma.

Regarding environment related factors: in this study, dampness present at home was found significant association with childhood asthma (p-value=0.001, OR=3.714. 95% CI: 1.558-9.340). Consistent findings was reported by Cheraghi et al India","container-title":"International Scholarly Research Notices","genre":"Research article","abstract":"We aimed to determine current prevalence of asthma and risk factors associated with it in Pune, India. Methods. This was a cross-sectional school-population-based study in which parents of school children aged 6-7 and 13-14 were administered an ISAAC questionnaire and an additional set of questions that detected the presence of potential risk factors known to be associated with asthma during 2008-2009 academic years. Results. Prevalence of current asthma was 6.7% (7% amongst 6-7-year olds and 6.3% amongst 13-14 year olds. Asthma was more common amongst boys (8.1%[9] where significant association between childhood asthma and presence of dampness at home (p-value=<0.001 AOR= 1.59, 95% CI: 1.07–2.38). Increased dampness, which in turn facilitates growth of fungus and molds which can induce asthma symptoms. Poor ventilation can also predispose to viral infection of the respiratory tract.

In this study, there was no significant association found between childhood asthma and birth weight, preterm birth, birth order, sex, education of parents, exposure to passive smoking and housing status of children.

Conclusions

Based on findings, it was concluded that child related factors, maternal factors and environmental factors were determinants for development of childhood asthma. Children aged six years and above, children who did not get exclusive breast feeding up to six months, children with history of allergy and rhinitis, history of maternal asthma and dampness present at home had found significant association with childhood asthma. Similarly, findings also showed that children diagnosed with asthma were vaccinated against influenza significantly higher than that of non-asthmatic children.

References

1. National Heart, Lungs and Blood Institute. Definition of asthma: [Internet]. 2017, May 22 [cited 12 July 2018]. Available from: https://www.nhlbi.nih.gov/health- topics/asthma.
2. World Health Organization. Key fact of asthma: [Internet]. 2017, August [cited 11 May 2018]. Available at: http://www.who.int/news-room/fact-sheets/detail/asthma.
3. Mathew AC, Prince TG, Remees R, Saravanapandian N, Ramalingam S, Srikanth K, et al. Prevalence and risk factors of asthma in school going children in South India: school based cross-sectional study at the urban field practice area of PSGIMSR. Nepal J Epidemiology. 2012; 2 (1): 171–178. DOI:10.3126/nje.v2i1.6378.
4. Gern J. The urban environment and childhood asthma study. J Allergy Clin Immunol. 2010; 125 (3): 545–549. DOI:10.1016/j.jaci.2010.01.037.
5. Kamran A, Hanif S, Murtaza G. Risk factors of childhood asthma In children attending Lyari general hospital: case-control study in the pediatrics clinic of general hospital. J Pak Med Assoc. 2015; 65 (6): 4. PMID: 26060164.
6. Glushkova AV, Grjibovski AM. Prevalence and correlates of asthma among children in central St. petersburg, Russia: a cross-sectional study from two central districts of St. Petersburg. Croat Med J. 2008; 49 (6):741–750. DOI:10.3325/cmj.2008.49.741.
7. Arora K. Prevalence and risk factors of asthma in urban schools of Ludhiana, Punjab: a questionnaire based cross-sectional study in three schools of urban Ludhiana. Indian J Med Res.

2015; 8 (2):104-108. DOI: 10.4103/2349-5006.174237.

8. Pal R, Dahal S, Pal S. Prevalence of bronchial asthma in Indian children. Indian J Community Med. 2009; 34 (4):310–316. DOI:10.4103/0970-0218.58389.
9. Cheraghi M, Dadgarinejad A, Salvi S. Prevalence and risk factors for childhood asthma In Pune City, India: a cross sectional school- population based study in Pune, India. Int. sch. res. notices. 2012; DOI:10.5402/2012/361456.
10. Dhakar A S, Kamath R, Pattanshetty S, Mayya SS. Prevalence of childhood asthma among 3–6 years old children: a community based cross-sectional study in Udupi Taluk, Karnataka. J Med Public Health. 2015; 4(6).
11. Sahito A, Khan A A, Tanzil S, Jamali T, Shahid A, Naeem S, et al. Burden of asthma among children in a developing megacity: community-based representative cross-sectional survey in Karachi Pakistan. Eur Respir J. 2015; 46 (suppl 59, PA1138. DOI:10.1183/13993003.congress-2015. PA1138.
12. Zhao K, Song G H, Gu H Q, Liu S, Zhang Y, Guo YR. Epidemiological survey and risk factor analysis of asthma in children in urban districts of Zhengzhou, China. Chin J Contemp Pediatr. 2014; 16 (12). PMID: 25523569.