MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2023.8.25.28

OPEN ACCESS

Key Words
Asthma, allergic rhinitis, bronchial asthma

Corresponding Author
Sangeeta Choudhary,
Department of Obstetrics and Gynecology, JNU Medical College, Jaipur, India
sunilgarhwalsms@gmail.com

Author Designation
[1-4]Senior Resident

Received: 17 August 2023
Accepted: 31 August 2023
Published: 1 September 2023

Citation: Sunil Kumar Garhwal, Kapil Sharma, Rakesh Yadav and Sangeeta Choudhary, 2023. Prevalence of Bronchial Asthma and Allergic Rhinitis in School Children of Jaipur. Res. J. Med. Sci., 17: 25-28, doi: 10.59218/makrjms.2023.8.25.28

Prevalence of Bronchial Asthma and Allergic Rhinitis in School Children of Jaipur

[1]Sunil Kumar Garhwal, [2]Kapil Sharma, [3]Rakesh Yadav and [4]Sangeeta Choudhary

[1]Department of Pediatrics, RUHS Medical College, Jaipur, India
[2]Department of Pediatrics, SMS Medical College, Jaipur, India
[3]Department of Obstetrics and Gynecology, Jnu Medical College, Jaipur, India

ABSTRACT

Asthma is a chronic inflammatory disease characterized by episodic airflow obstruction, airways hyper-responsiveness to common provocative and inflammation. It is one of the common chronic disease in children worldwide. To study the prevalence of Bronchial Asthma and Allergic Rhinitis in school children of Jaipur (urban and rural). Study conducted on 4500 school going children of 6-18 years of age from May 2020 to July 2021 by Stratified random sampling. All children 6-18 years from the selected schools who willing to participate in our study (parents in case of younger children) A standard (predesigned validated) questionnaire was provided to children and their parents. The Questionnaire were collected after online submission and checked by researcher and according to scoring labeled as bronchial asthma, allergic rhinitis and allergic conjunctivitis. Male children were 2350 (52.22%) and female children were 150 (47.78%). The prevalence of Allergic Rhinitis and Asthma were 15.68 12.62%, respectively. The prevalence of Allergic Rhinitis and Asthma showed an increasing trend as the age increases. Both allergic diseases are existing as co morbidities in a significant proportion of children demanding a comprehensive strategic approach to deal with them.

INTRODUCTION

Asthma is a chronic inflammatory disease characterized by episodic airflow obstruction, airways hyper-responsiveness to common provocative and inflammation. It is one of the common chronic disease in children worldwide. The prevalence of childhood bronchial asthma varies from 4-32% in different geographical areas[1]. Various studies have estimated the prevalence of Bronchial Asthma to be 5-30% in pediatric population of different backgrounds in India[2-4]. The childhood Asthma is multifactorial with combination of environmental exposures and inherent and genetic factors playing significant role in etiology. Acute exacerbation of childhood asthma is one of the reason for frequent hospitalization. The diagnosis of asthma is based on the history of characteristic symptom patterns and evidence of variable airflow limitation characteristically very over time and in intensity.

Allergic Rhinitis is an inflammatory disorder of the nasal mucosa characterized by nasal congestion, rhinorrhea, itching, often accompanied by sneezing and conjunctival inflammation. The prevalence of allergic rhinitis has been estimated to be between 20-30%. Older children have a higher prevalence of allergic rhinitis then younger ones.

Asthma and Allergic rhinitis co-morbidity refers to the association between asthma and allergic rhinitis. The fact that, asthma and allergic rhinitis are manifestations of the same inflammatory disease affecting the entire airway is further suggested by clinical improvement of asthma when allergic rhinitis is treated. Epidemiologically, there have been reports-mostly in ambulatory based studies showing high prevalence rates of allergic rhinitis in asthmatic patients, with rates varying between 30-90%[5]. However, population based studies on the prevalence of rates of asthma and allergic rhinitis co morbidity are still scarce.

The purpose of study to made early diagnosis of bronchial asthma and allergic rhinitis thus helping in reducing the school absenteeism, hidden iceberg of the disease, recognizing high risk individuals and improving their quality of life.

Aim: To study the prevalence of Bronchial Asthma and Allergic Rhinitis in school children of Jaipur (urban and rural).

MATERIALS AND METHODS

This was a Cross sectional questionnaire based observational study conducted on 4500 school going children of 6-18 years of age from May 2020 to July 2021 by Stratified random sampling. All children 6-18 years from the selected schools who willing to participate in our study (parents in case of younger children). Students whose age <6 and >18 years, any craniofacial anomaly, history of persistent cough with fever, not getting resolved, any structural anomaly of nose, local abusive drug inhalation, any local surgery, head trauma with nasal discharge, smoking and Chronic lung disease were ruled out from study.

General Information consisting of general demographic information about children were taken. Written permission was taken from Principal/Authority of Schools and informed consent from children/ parents/guardian. On visit day meeting was done with teachers to explain the purpose of study and procedure of filling the questionnaire via online link. A standard (predesigned validated) questionnaire was provided to children and their parents. Questionnaire contains 13 questions. Bronchial Asthma: For questions 1 through 7, assign a "1" for each "sometimes" or "a lot" response. Add the scores. If the total is 3 or more, the diagnosis of asthma made. (A total score of 3 has an estimated sensitivity of 80% and specificity of 70%, according to the clinical predictability of the questionnaire in a validation study).

Allergic rhinitis: For question no. 9, assign a "1" for each "sometimes" or "a lot" response. Add the scores. If the total is 1 or more, the diagnosis of allergic rhinitis made. (A total score of 1 has an estimated sensitivity of 81% and specificity of 42%, according to the clinical predictability of the questionnaire in a validation study). Questions no. 10-13 were for past history of asthma/allergy regarding diagnosis, hospitalization or/and medicines of subject and not included in scoring. The Questionnaire was collected after online submission. The Questionnaire were given serial no. 1 to 4500, checked by researcher and according to scoring labeled as bronchial asthma, allergic rhinitis and allergic conjunctivitis. Data thus collected were entered into Excel worksheet and classified and analyzed according to aims and objectives.

RESULTS

In our study population male children were 2350 (52.22%) and female children were 150 (47.78%) (Table 1).

Among the 4500 children, 2425 (53.88%) were the Rural population and 2075 (46.11%) were Urban population. In our study population 1025 (22.77%) are suffer from one or more of allergic (respiratory ocular) disease.

Overall prevalence of bronchial asthma in study population was 12.62%. Overall Prevalence of Allergic Rhinitis in study population was 15.68% (Table 2).

Among 4500 children 327 (13.48%) from rural population and 241 (11.62%) from urban population having asthmatic symptoms and 408 (16.82%) from rural population and 298 (14.36%) from urban population having Allergic Rhinitis symptoms.

Table 1: Distribution of study population according to socio demography

	Sex			
	Male		Female	
Age group (years)	No.	Percentage	No.	Percentage
6-10	119	2.64	108	2.40
11-12	345	7.67	310	6.89
13-14	678	15.07	588	13.07
15-16	825	18.33	820	18.22
17-18	383	8.51	324	7.20
Total	2350	52.22	2150	47.78
Area				
Rural	2425		53.88%	
Urban	2075		46.11%	

Mean age male: 14.31±2.27 years, Mean age female: 14.35±2.40 years

Table 2: Prevalence of bronchial asthma and allergic rhinitis in study population

	Allergic rhinitis (n = 706)		BA (n = 568)	
Age group (years) (n = 4500)	No. of cases	Percentage	No. of cases	Percentage
6-10 (227)	27	11.89	25	11.01
11-12 (655)	84	12.82	74	11.29
13-14 (1266)	211	16.66	154	12.16
15-16 (1645)	262	15.92	200	12.15
17-18 (707)	122	17.25	115	16.26
Area				
Rural	408	16.82	327	13.48
Urban	298	14.36	241	11.61

Table 3: Association of allergic rhinitis and bronchial asthma

AR co-morbidity status	No. of cases	Cases (%)
Allergic rhinitis with BA	353	50.00
Allergic rhinitis without BA	353	50.00
BA co-morbidity status		
Bronchial Asthma with AR	353	62.15
Bronchial Asthma without AR	215	37.85

Table 4: Bronchial asthma and other co-morbidity in the study population

Disease	Male	Female	Total
BA alone	69	76	145
AR alone	116	125	241
AC alone	49	55	104
BA+AC	32	38	70
BA+AR	81	88	169
BA+AC+AR	84	100	184

Fifty percent of children with Allergic Rhinitis had Bronchial Asthma as comorbidity. 62.15% of children with Bronchial Asthma had Allergic Rhinitis as comorbidity (Table 3).

Our study shows Asthma and Allergic Rhinitis as comorbidities (353/4500) 7.84% cases (Table 4).

DISCUSSIONS

Asthma and allergic rhinitis are the most common chronic diseases of childhood. We conducted this study on 4500 school going children of age group 6 to 18 years belonging to both urban and rural areas of Jaipur district.

The study included 2350 (52.22%) male and 2150 (47.78%) female children. Out of 4500 children, 2075 (46.12%) were from urban and 2425 (53.88%) were from rural background.

Our study shows the overall occurrence of bronchial Asthma is (568/4500) 12.62%. The prevalence of BA is increasing with age. Sharma *et al*.[6] also reported similar observation.

Dara *et al*.[7], in his study in 5002 school children from Jaipur showed the prevalence of Bronchial Asthma 18.63%. High prevalence in this study as compared to ours can be attributed to different methodology used in sample collection as in this study sample collected in schools and in our study due to COVID-19, sample collected via online.

In our study the prevalence of Bronchial Asthma in the Rural area is 13.48% (327/2425) which is higher as compared to Urban area 11.61% (241/2075). Jain *et al*.[8] showed prevalence of bronchial asthma to be 10.3% The increased prevalence rate in our study as compared to this study is also indicative that the overall prevalence of BA is increasing equally in rural areas also during last few years.

Our study shows the overall occurrence of Allergic Rhinitis to be (706/4500) 15.68%. The prevalence of AR is increasing with age. Ibáñez *et al*.[9] from Spain reported that Rhinitis was diagnosed in 42.5% of the children in their study. The higher prevalence in this study as compared to ours can be attributed to a different socio-geographical setting in Europe. Also Dara *et al*.[7] in their study in 5002 school children from Jaipur showed the prevalence of Allergic Rhinitis 24.31%. High prevalence in this study as compared to ours can be attributed to different methodology used in sample collection as in this study sample collected in schools and in our study due to COVID- 19 sample collected via online. Our study shows that Allergic Rhinitis children suffer from Asthma in 50.00% (353/706) cases.

Saini *et al*.[10] studied the prevalence of Allergic Rhinitis (AR) and its associated co-morbidity in school going children in urban area of Jaipur City, Rajasthan and they showed the prevalence of Asthma as co-morbidity in children with allergic rhinitis to be 19.16%. The difference in observations with our study is probably because of their small size of study group and only limited to urban area.

Our study shows that 353 out of 568 (62.15%) Asthmatic children also suffer from Allergic Rhinitis.

Maio *et al*.[11], studied 995 asthmatic patients in Italy, of which 60.6% had allergic rhinitis.

Our study shows Asthma and Allergic Rhinitis as comorbidities m (353/4500) 7.84% cases.

de Andrade *et al*.[5] conducted a study among 3083 adolescent children (13-14 years) in Brazil. The prevalence of asthma and AR co-morbidity was 8.4% in their study.

The above studies also confirm the association of both the conditions as comorbities in a significant proportion of patients. The low rate of association in these studies as compared to us could be attributed to difference in social and geographical characteristics.

CONCLUSION

It was found that the prevalence of both Allergic Rhinitis and Asthma are showing a significant increase in last few years posing a significant morbidity burden on the society. These allergic diseases are existing as co morbidities in a significant proportion of children demanding a comprehensive strategic approach to deal with them.

REFERENCES

1. Pal, R., S. Dahal and S. Pal, 2009. Prevalence of bronchial asthma in Indian children. Indian J. Community Med., 34: 310-316.
2. Gupta, D., A.N. Aggarwal, R. Kumar and S.K. Jindal, 2001. Prevalence of bronchial asthma and association with environmental tobacco smoke exposure in adolescent school children in Chandigarh, North India. J. Asthma, 38: 501-507.
3. Paramesh, H., 2002. Epidemiology of asthma in India. Indian J. Pediatr., 69: 309-312.
4. CDCP., 2016. Most recent asthma data., https://www.cdc.gov/asthma/most_recent_data.htm
5. de Andrade, C .R., C.D. Ibiapina, C.G. Alvim, M.J.F. Fontes, L.M.D.B.F. Lasmar and P.A.M. Camargos, 2008. Asthma and allergic rhinitis co-morbidity: A cross-sectional questionnaire study on adolescents aged 13-14 years. Primary Care Respir. J., 17: 222-225.
6. Sharma, B.S., M.K. Gupta and R. Chandel, 2012. Prevalence of asthma in urban school children in Jaipur, Rajasthan. Indian Pediatr., 49: 835-836.
7. Dara, P.K., H.M. Meena, P. Kumari, B.S. Sharma, P. Sharma and G. Dara, 2017. Allergic rhinitis and bronchial asthma comorbidity: A cross sectional questionnaire study in children (6-18 years) of urban and Rural Jaipur (India). J. Med. Sci. Clin. Res., 5: 24417-24422.
8. Jain, A., H.V. Bhat and D. Acharya, 2010. Prevalence of bronchial asthma in rural Indian children: A cross sectional study from South India. Indian J. Pediatr., 77: 31-35.
9. Ibáñez, M.D., A. Navarro, M.C. Sánchez, C. Rondón and J. Montoro *et al*., 2010. Rhinitis and its association with asthma in patients under 14 years of age treated in allergy departments in Spain. J. Investig. Allergol. Clin. Immunol., 20: 402-406.
10. Saini, A., M. Gupta, B.S. Sharma, M. Kakkar, G. Chaturvedy and M. Gupta, 2013. Rhinitis, sinusitis and ocular disease-2085: Prevalence of allergic rhinitis in urban school children, Jaipur City, India. World Allergy Org. J., Vol. 6. 10.1186/1939-4551-6-s1-p164
11. Maio, S., S. Baldacci, M. Simoni, A. Angino and F. Martini *et al*., 2012. Impact of asthma and comorbid allergic rhinitis on quality of life and control in patients of Italian general practitioners. J. Asthma, 49: 854-861.