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Prevalence of asthma and asthma like symptoms in children in rural area of karveer taluka and various factors associated with it.

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Abstract
Background*: Occurrence and prevalence of bronchial asthma varies geographically. In West India, there is paucity of community-based studies to determine the prevalence of asthma in children in mofussil places of residence.*
Aim*: To assess the prevalence of asthma in children in rural areas of Karveer taluka in Kolhapur district and their associated risk factors.*
Methods*: Eleven schools from 12 villages in Karveer Taluka, Maharashtra were approached and 1250 standard ISAAC questionnaires were distributed. Additional questions to determine the presence of potential environmental risk factors and eating habits were included therein. Data was analyzed using SPSS to determine the prevalence of asthma; univariate association between individual potential risk factors were assessed at 95% confidence level (P<0.05). Relevant predictors of model were determined through AIC and result of fit was built through R software to predict Hosmer-Lemeshow goodness-of-fit.*
Results*: Prevalence of bronchial asthma was 6%. Age had an inverse relationship with prevalence of asthma (P=0.0006). Children exposed to bidi or cigarette smoking at home (OR 2.15; 95% CI [0.9667, 4.3545]; P=0.044), dampness in the wall (OR 2.19; 95% CI [0.6735, 5.7578]; P=0.1435) and consumption of ice cream (OR 2.41; 95% CI [0.6857, 7.1017]; P=0.1340) were found to be at double the risk of developing asthma. Seasonal variation was six times more likely to induce asthma and further aggravation thereof. (OR 6.0398; 95% CI [2.3223, 14.606]; P=0.0001).*
Conclusion: *High prevalence of Bronchial Asthma in children of Karveer taluka in Kolhapur district necessitates the need for intervention to reduce the positively associated, detrimental -to-health factors such as smoking indoors, dampness in walls of dwellings and some unadvisable eating habits.*
Keywords: *Bronchial Asthma, prevalence, children, Rural, Risk factors*

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I. Introduction:

Asthma is a common childhood illness.

Asthma is a chronic inflammatory disease of the airway and is witnessing a rise in its incidence.[1-4] The existence of geographical variation in the incidence of asthma has given rise to numerous studies to assess its prevalence in India especially in the rural and urban setting.[5-7] Despite improved assessment and management of asthma, there is no cure. Therefore, understanding the role of risk factors is crucial for prevention of this bronchial condition.[8] Some important risk factors of asthma are environmental factors, especially exposure to pollution, allergens, unwise food habits and sedentary Life-style.[9] Improved knowledge of the risk factors will empower health providers in school health services to reduce the burden of asthma in children. Prevalence of asthma in children is increasing in rural areas of India.[10] Increasing industrialization in Karveer taluka due to foundries may have an impact on prevalence of asthma in rural children.[11] Therefore, the aim of the study was to evaluate the prevalence of asthma and associated risk factors in rural area of Karveer taluka among school-going children.

II. Material and Methods:

Of the 121 villages in Karveer taluka, 12 villages were randomly chosen for this cross-sectional study. All twelve schools were approached of which 11 were ready for the study, standard ISAAC questionnaire along with additional questionnaire for risk factor assessment were distributed by two social workers from Kolhapur. The questionnaires were distributed by simple random sampling method. The social workers were trained to fill the questionnaires for the target-group for this study. Written informed consent was obtained from the parents and verbal assent was obtained from children above eight years of age.[9] The weight of the children was measured with a standardized weighing scale (bathroom scale) with minimal clothes and without footwear. The height was measured using a standard stadiometer. Additional questionnaire was translated to Marathi and re-translated to English and validated. The pilot study was carried out on 25 children who were not a part of the Study sample. Additional questions (n=12) were included to determine the presence of potential environmental risk factors (cigarette and bidi smoking at home, dampness in the walls of dwellings, accompanying pet animals and seasonal variation) and eating habits (ice-creams and cold drinks). The study was approved by the Institutional ethics committee.

The sample size was calculated to be 1164 based on the prevalence of asthma in rural areas (p=3%) using the formula $n = 4*p*q/L^2$.[12] Therefore, 1250 questionnaire were distributed to students after obtaining consent from the parents and school authorities.

Data collected was analyzed using SPSS. The prevalence of asthma was calculated. Univariate association between individual risk factors and asthma was calculated using crude odd's ratio at 95% confidence level. Independent effect of risk factors that demonstrated a univariate association with asthma was analyzed through multivariate analysis using logistic regression and adjusted odds ratio at 95% confidence interval. Relevant predictors of the model were determined through backward elimination on Akaike's Information Criterion (AIC). The result of fit was built using R software (version) to predict the P value of Hosmer-Lemeshow goodness-of-fit.

III. Results:

Parent and student participation was 97.52 %, with 1219 filled questionnaires received back from the total 1250 distributed.. There was an unequal Gender distribution with a higher proportion of boys (n=828) as compared to girls (n=391) (Table 1). Mean height of the population ranged from 111.6 - 149.25 cm and weight 16.57 - 37.25 kg for the ages between 05 and 15 years. A positive correlation (r=0.93) was observed with mean height and weight.

Table 1: Demographic distribution of the study population

Variable		Children N (%)
Study Sample		1219
Sex	**Male**	828
	Female	391 (32.08)
Age	**Mean age**	11 (11.5)
	Age 5 years	7 (0.57)
	6-11 years	484 (39.7)
	12-14 years	688 (56.44)
	> 14 years	40 (3.28)

Age had an inverse relationship with the prevalence of asthma (P=0.0006) .The age group 6 to 8 years had prevalence of 11% ,8 to 11 years had 6.9 % and 11 to 14 years age group had 4.7% prevalence.

Table 2 Prevalence and risk factors of asthma

Variable	Yes	No
Bidi cigarette smoking at home	86 (7.05)	1123 (92.95)
Motorcycle ride	56 (4.59)	1163 (95.41)
Dampness in the house	45 (3.69)	1174 (96.31)
Breathlessness in family members	40 (3.28)	1179 (96.71)

Pet animal		311 (25.51)	908 (74.79)
Seasonal variation		312 (25.59)	907 (74.41)
Whether dust in house causes breathlessness		37 (3.04)	1182 (96.96)
Whether Ice cream or cold drinks cause breathlessness		33 (2.71)	1186 (97.29)
Cooking Fuel	**Gas**	874 (71.7)	
	kerosene	344 (28.22)	
	Firewood	0 (0)	
	Cow dung	1 (0.08)	
Repeated cough, cold?		46 (3.77)	1173 (96.23)
Whether low birth weight?		234 (19.20)	985 (80.80)
Prevalence of asthma		73 (5.99)	1146 (94.01)
Doctor diagnosed		13 (1.07)	1206 (98.93)
Ever Wheezing		32 (2.63)	1187 (97.37)
Wheezing at present		35(2.87)	1184 (97.13)

The prevalence of asthma was 6%.The ever wheezing was 2.63%, current wheezing was 2.87% (table 2). Results of the goodness of the fit is presented in Table 3 (P=0.176). The multiple logistic regression analysis confirmed that children who were exposed to bidi or cigarette smoking at home (OR 2.15; 95% CI [0.9667, 4.3545]; P=0.044), dampness in the wall (OR 2.19; 95% CI [0.6735, 5.7578]; P=0.1435) and consumption of ice cream (OR 2.41; 95% CI [0.6857, 7.1017]; P=0.1340) were at double the risk of experiencing asthma or asthma-related symptoms as compared to those children who were not exposed to these factors (Table 2). Conversely, increasing age and having a pet's presence at home reduced the risk of asthma. Seasonal variation was the highest environmental risk factor in the development of asthma in children (OR 6.0398; 95% CI [2.3223, 14.606]; P=0.0001).

Table 3 Risk Factors for Asthma in Rural Children in Karveer Taluka

Factors	**Estimate**	**Odds Ratio**	**95 % Confidence Interval**		**P-value**
			2.50%	**97.50%**	
Intercept	-1.19483	0.30276	0.0971	0.8796	0.0331
Age	-0.17372	0.84053	0.7613	0.9299	0.0006
Bidi, Cigarettes Smoking at Home	0.76578	2.15067	0.9667	4.3545	0.044
Dampness in wall	0.78612	2.19486	0.6735	5.7578	0.1435
Pet Animals	-1.13531	0.32132	0.1023	0.9931	0.0495
Cooking Fuel	-0.3212	0.72528	0.3793	1.3235	0.3114
Motorcycle Rides	-0.04592	0.95512	0.26	2.657	0.9369
Family History of Asthma	0.204	1.2263	0.2147	4.6721	0.7906
House Dust	0.19048	1.20983	0.2896	3.7626	0.7665
Seasonal Variation	1.79837	6.0398	2.3223	14.606	0.0001
Ice-Cream, Cold Drinks	0.88119	2.41378	0.6857	7.1017	0.134
Repeated Cough, Cold	0.32925	1.38993	0.3521	4.3929	0.6048
Low Birth Weight	0.0514	1.05275	0.4369	2.6052	0.91

IV. Discussion:

Prevalence of asthma in children and identification of potential environmental risk factors is crucial in devising primary prevention methods. A high response rate of 97.5% reflects the parent's willingness to participate in such questionnaire-based studies. There is an evident male predominance in such studies conducted in India concurrent to this study.[13] Overall prevalence was around 7.24%.[14] There seems to be a regional variation in the prevalence of asthma with South Indian studies reporting 10.3% , 5.7%, and 5 % and North Indian studies with lower prevalence of 2% and 2.6 % in rural areas.[15-17] In a study by Rodriguez et al., lifestyle domains were studied and incidence of asthma in rural children was 10.3% and in urban children was 9.45%.[18] The difference was attributed to home infrastructure and poor housing conditions. This is the first Report from the region of rural Kolhapur and the prevalence reported is higher in the Northern part of the country.

Inverse linear relationship between age and asthma episodes is an established phenomenon and gender influence is contestable. Higher male predominance and higher female preponderance was found in different studies. [13,19-21]

Passive smoking or environmental tobacco-smoke is an important risk factor in the development of asthma in children. [22,23] Indoor dampness is an established risk factor of health effects and excess indoor dampness is a public health problem and prevention of the same ought to be considered as a prime public health goal.[24] Home dampness is associated with upto 50% increase in respiratory health problems.[25,26]

Seasonal variation is pivotal in onset and recurrence of asthma with higher incidence was noticed and found in spring as compared to winter.[27] Pet animals were negatively associated with asthma due to sensitization.[28] Oral challenge with ice is associated with non-immunologically provoked mediator release but the same requires further research.[29] However, the precise effect of environmental factors on the onset and recurrence of asthma must be confirmed with pulmonary function tests.

The limitations of this study is that it covered a small geographic area and follow up of suspected patients was not done.

The prevalence of asthma in rural area of Karveer taluka of Kolhapur district, India was found to be 6% which is more when compared to the studies done in North India. This may be due to increased industrialization in the rural areas and because of increasing pollution from motor vehicles. The knowledge about the risk factors would help in creating public awareness about smoking, dampness in houses and change in eating habits. This may be helpful in further decreasing the prevalence of asthma in the region and vicinity thereof.

V. Conclusion:

High prevalence of Asthma in rural Karveer necessitates the need for intervention to reduce the primary factors. Health education in parents can reverse the environmental triggers, especially dampness, moisture in the walls of dwellings and indoor-smoking.

Conflict of Interest: The authors declare no conflict of interest.

References

[1]. The International study of asthma and allergies in childhood (ISAAC) steering committee. Worldwide prevalence of symptoms of asthma, allergic rhino-conjunctivitis and atopic asthma. Lancet 1998; 351:1225-1235

[2]. Liu AH, Covar RA , Spahn JD, Sicherer SH ,Childhood Asthma, Editor Kliegman RM, Stanton BF , St.Geme III JW , Schor AF Behrman RE in Nelson Textbook of Pediatrics first south Asia Edition volume 1 2016 by Reed Elsevier India private limited.p1095-1115

[3]. Subramaniyam L, Shivbalan So, Childhood asthma-basics and diagnosis in subramaniyam L editor Essentials of Pediatric Pulmonology, IIIrd edition Chennai PPFI 2008 p 98-108

[4]. Parmesh H, epidemiology of asthma in India, Indian J Peditatr, 2002; 69(4):309-12 DOI:10.1007/bf02723216

[5]. Narayana PP, Prasanna MP, Narahari SR, Guruprasad AM. Prevalence of asthma in school children in rural India. Ann Thorac Med. 2010; 5(2):118. doi: 10.4103/1817-1737.62478

[6]. Ferrante G, La Grutta S. The burden of pediatric asthma. Front Pediatr. 2018 Jun;6:186. doi: 10.3389/fped.2018.00186

[7]. Estrada RD, Ownby DR. Rural asthma: current understanding of prevalence, patterns, and interventions for children and adolescents. Curr Allergy Asthma Rep. 2017;17(6):37. doi: 10.1007/s11882-017-0704-3

[8]. Beasley R, Semprini A, Mitchell EA. Risk factors for asthma: is prevention possible? Lancet. 2015;386(9998):1075–85.

[9]. International study of Bronchial Asthma and allergies in childhood (ISAAC) Worldwide variations in the prevalence of Bronchial Asthma symptoms. Euro Respir J. 1998;12:315–35.

[10]. Sharma CM, Bhatia SS, Sharma D, Agrawal RP, Meghwani MK, Kumar B. Prevalence of asthma in school children of rural areas of Kanpur, Uttar Pradesh. J Evol Med Dent Sci. 2013;2:5298-301.

[11]. Patil, Prajakta & Desai, Prajakta. (2019). Environmental Impact of Foundries and Health Related Issues Introduction. 240-246. National Conference on Recent Practices in Conventional and Non Conventional Energy Resources RPCNeR-2013

[12]. Jain A, Bhat HV, Acharya D. Prevalence of bronchial asthma in rural Indian children: A cross sectional study from South India.Indian J Pediatr. 2010;77(1):31-5.

[13]. Paramesh H. Epidemiology of asthma in India. Indian J Pediatr 2002; 69:309-312.

[14]. Pal R, Dahal S, Pal S. Prevalence of bronchial asthma in Indian children. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine. 2009 Oct;34(4):310. doi: 10.4103/0970-0218.58389

[15]. Chakravarthy SK, Singh RB, Swaminathan S, Venkatesan P. Prevalence of Asthma in urban and rural children in Tamil Nadu. Natl Med. J. India 2002; 15: 260-263.

[16]. Singh D, Sobti PC, Arora V, Soni RK. Epidemiological study of asthma in rural children. Indian J Comm Med 2002; 27:167-170.
[17]. Pokharel PK, Kabra SK, Kapoor SK, Pandey RM. Risk factors associated with bronchial asthma in school going children of rural Haryana. Indian J Pediatr 2001; 68: 103-6.
[18]. Rodriguez A, Vaca MG, Chico ME, Rodrigues LC, Barreto ML, Cooper PJ. Lifestyle domains as determinants of wheeze prevalence in urban and rural schoolchildren in Ecuador: cross sectional analysis. Environmental Health. 2015;14(1):15.
[19]. Schenker MB, Samet JM, Speizer FE. Risk factors for childhood respiratory disease: The effect of host factors and home environmental exposures. Am Rev Respir Dis 1983; 128: 1038 – 1043
[20]. Verity CM, Vanheule B, Carswell F, Hughes AO. Bronchial lability and skin reactivity in siblings of asthmatic children. Arch Dis Child 1984; 59: 871-876.
[21]. Viswanathan R. The Problem of asthma. Indian J Chest Dis 1972; 14: 272-288.
[22]. Karunaeskara KA, Jayasinghe JA, Alwis LW. Risk factors of childhood asthma: A Sri Lankan Study. J Trop Pediatr 2001; 47: 142 – 145
[23]. Gupta D, Aggarwal AN, Chaudhary K, Chhabra SK, D'souza GA, Jindal SK, et al, Household Environmental Tobacco smoke Exposure, Respiratory Symptoms and Asthma in Non-smoker adults :a Multicentric Population study from India. Indian J Chest Dis Allied Sci.2006;48:31-6
[24]. Bornehag CG, Sundell J, Bonini S, et al. Dampness in buildings as a risk factor for health effects, EUROEXPO: a multidisciplinary review of the literature (1998–2000) on dampness and mite exposure in buildings and health effects. Indoor Air 2004;14:243–57.
[25]. Spaces ID. HealthCommittee on Damp Indoor Spaces and Health. Institute of Medicine. 2004.
[26]. Sahakian NM, Park JH, Cox-Ganser JM. Dampness and mold in the indoor environment: implications for asthma. Immunol Allergy Clin North Am. 2008;28(3):485-505.
[27]. Khot A, Burn R, Evans N, Lenney C, Lenney W. Seasonal variation and time trends in childhood asthma in England and Wales 1975-81. Br Med J (Clin Res Ed). 1984 Jul 28;289(6439):235-7.
[28]. Vedanthan PK, Mahesh PA, Vedanthan R, Holla AD, Liu AH. Effect of animal contact and microbial exposures on the prevalence of atopy and asthma in urban vs rural children in India. Ann Allergy Asthma Immunol. 2006; 96(4):571-8.
[29]. Wilson NM, Chudry N, Silverman M. Role of the oesophagus in asthma induced by the ingestion of ice and acid. Thorax. 1987;42(7):506-10.

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