

ORIGINAL RESEARCH

## EVALUATION OF HOUSING CONDITIONS AND IYCF (INFANT AND YOUNG CHILD FEEDING) PRACTICES AMONG CHILDREN WITH ACUTE RESPIRATORY INFECTION (ARI) RESIDING IN SLUM AREA

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### ABSTRACT

**Introduction:** Acute respiratory infections (ARI) are the leading cause of mortality and morbidity globally in children under five years of age. Many risk factors for these infections have been reported which include mostly the climatic conditions and also the poverty, poor nutrition, poor housing conditions, indoor air pollution such as parental smoking, absence of ventilation, overcrowding etc.

**Materials and Methodology:** A sample of 450 children was included in the study population after calculated using the formula. The slums were selected using simple random sampling procedure (Lottery method). Personal visits were made to the houses of all the subjects, children were examined and the parent/care-taker was personally interviewed using the pre-tested questionnaire. A  $p < 0.05$  was considered as statistically significant.

**Results:** The present study was undertaken by selecting 450 children. The areas selected for the present study were characterized by a high rate of illiteracy, poor socioeconomic conditions and delayed utilization of medical facilities. ARI was detected among 122 children. Therefore, the incidence rate of ARI in our study was 27.25%. URTI was found in 19.25% of the cases, and LRTI was diagnosed in the remaining 8%.

**Conclusion:** ARI is reported to be a public health concern killing millions of our future citizens across the country. The study would be an eye-opener for further research in those areas with poor health care settings due to fewer resources.

**Keywords:** acute respiratory infections, under five children, slum

## INTRODUCTION

Condition like Acute Respiratory Infections (ARI) constitutes one of the leading reasons of morbidity and mortality. This ARI banks for about 4.2 million of the 15 million child mortality across the world each year. Worldwide, the admissions due to ARI accounts for about 30-60% of paediatric outpatient attendance and 20-30% of hospital admissions. Various chronic illness like deafness, breathing difficulty and their consequent disability among children might contribute their beginning to insufficiently treated episodes of ARI.<sup>1</sup> When considering the developing countries like India, close to 50% of all child mortality in the community are among under-five age group children (WHO comprise 13% of the general population).<sup>2</sup> Considering the kids under the age of 5 years, ARI poses specific mortality in 20-25%. Taking this into consideration, one million deaths among under-fives in our Country are documented due to ARI and most of these occur among infants.<sup>3</sup> The mortality because of ARI in developing countries is 10 to 50 times greater than the developed countries.<sup>4</sup> Moreover, in our country, 14.3% of deaths reported during infancy and 15.9% of deaths reported in the age range between 1-5 years of age are due to ARI.<sup>5,6</sup>

Acute Respiratory Infections are those inflammations involving the respiratory tract anywhere from nose to alveoli, with a varied range of combination of signs and symptoms. ARIs are most commonly classified as per their clinical syndromes depending upon the site of involvement and is denoted as ARI of upper (AURI) and lower (ALRI) respiratory tract. The upper respiratory tract infection mostly comprised of common cold, pharyngitis and otitis media. The lower respiratory tract includes epiglottitis, laryngitis, laryngotracheitis, bronchitis, bronchiolitis and pneumonia.<sup>4</sup> Many risk factors for these infections have been reported which include mostly the climatic conditions and also the poverty, poor nutrition, poor housing conditions, indoor air pollution such as parental smoking, absence of ventilation, overcrowding etc.<sup>7,8</sup>

There are various studies that had already been carried out with regard to the prevalence and risk factors of ARI in slums in different parts of India; but due to diversity of the population residing in slum area, their housing and their living conditions and various health related challenges in different parts of the country, the findings are cumbersome to generalize across India. This study was formulated with the objective of determining ARI morbidity among under-fives in urban slums, and to study the epidemiological factors like housing conditions and infant feeding practices that are responsible for same.

## MATERIALS AND METHODOLOGY

The present study was carried out like a longitudinal cohort in a few urban slum areas. After obtaining clearance from the Institutional Ethical Review committee, the study was commenced. The study population basically comprised of under-five age group children who are divided into 5 different groups.

A sample of 450 children was included in the study population after calculated using the formula. The slums were selected using simple random sampling procedure (Lottery method). As per census data documented in the year 2001 which was conducted by the Census commission rate of India, under-five children comprise 13% of the total population in India. Personal visits were made to the houses of all the subjects, children were examined and the parent/care-taker was personally interviewed using the pre-tested questionnaire. Any

subject with an ARI episode was noted in the proforma. Details with respect to the determinants of ARI and information of the episode were documented using the questionnaire method. Standard case definitions were used for all the variables. Adequate housing status was estimated by the presence of separate kitchen in the house, pucca roofing/flooring and smoke outlets in kitchen and bathroom.<sup>9</sup>

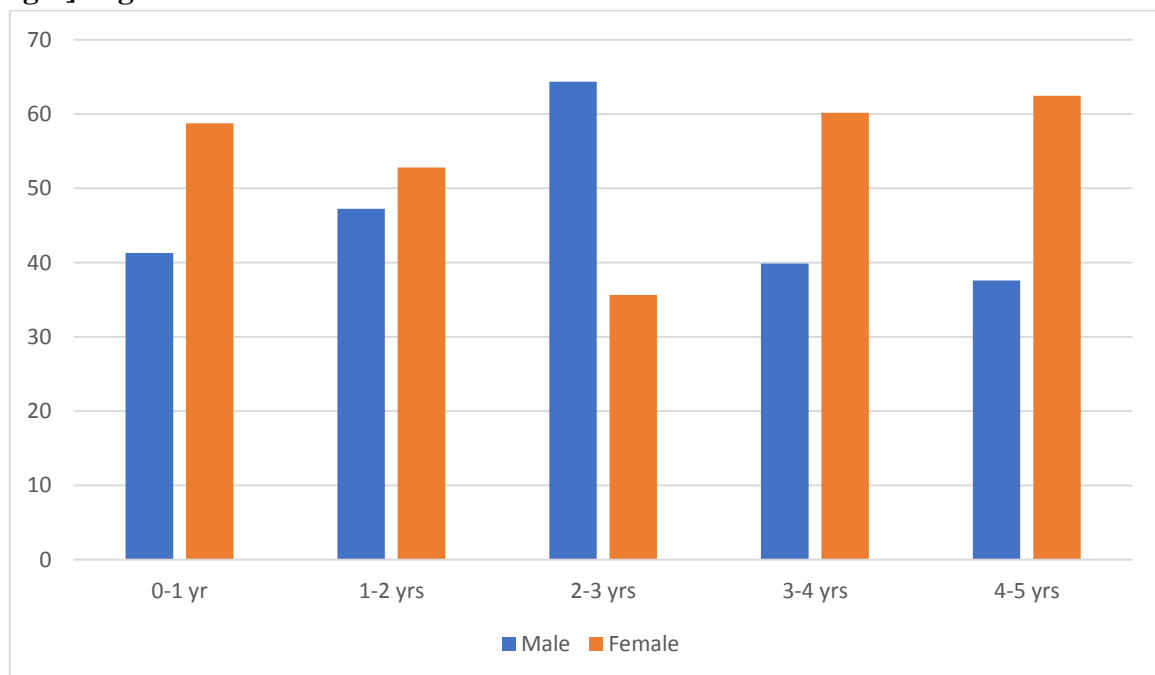
Data were evaluated using the Statistical Package for the Social Sciences (SPSS) (IBM SPSS Chicago USA version 25). Descriptive statistics (mean and SD) were calculated for the continuous variables and the frequencies and percentages were calculated to consolidate the qualitative variables. The multivariate logistic regression analysis was then carried out to denote the determinants of ARI. A  $p < 0.05$  was considered as statistically significant.

## RESULTS

The present study was undertaken by selecting 450 children. The areas selected for the present study were characterized by a high rate of illiteracy, poor socioeconomic conditions and delayed utilization of medical facilities. ARI was detected among 122 children. Therefore, the incidence rate of ARI in our study was 27.25%. URTI was found in 19.25% of the cases, and LRTI was diagnosed in the remaining 8%.

Table-2 depicts the variables which might show a significant association with the incidence of ARI. The incidence of ARI among the cohort when stratified by age was found to be high reported among infants.

**[Fig-1]: Age and Sex-wise distribution of children**



**[Table/Fig-2]: Variables showing significant association with ARI incidence**

S.No	Variables		ARI present		ARI absent		P – value
			(n)	%	(n)	%	
1	Housing status	Kutch-pucca	141	31.33	309	68.67	0.602
		Pucca	290	64.5	160	35.5	
2	Type of feeding only breast feed	For 6 months	206	45.78	244	54.22	0.478
		Less than 6months	262	58.32	188	41.68	
	Bottle feed	Yes	211	47.86	239	52.14	0.932
		No	203	45.22	247	54.78	

## DISCUSSION

In our study that was conducted, the incidence of ARI was found to be 27.25%. Our study results could possibly be compared with the studies conducted by Mitra NK, Murali madhav S et al., and Board on Science and Technology in International Development (BOSTID) researchers.<sup>1,12</sup> WHO documents that the incidence of ARI is identical in developed and developing countries.<sup>7</sup> In this study, URTI was found in 19.25% of children and LRTI in 8%. The results could evenly be compared with the results obtained by Acharya D et al, Chhabra P et al, Zaman K et al.<sup>4,13,14</sup> WHO reports denotes the incidence of pneumonia in developing countries possibly ranging from 20% to 30%. But, the range in developed countries was found to be 3% - 5%. BOSTID researchers have found that the incidence rates of LRI in developing countries ranges from 0.4 - 8.2 episodes per 100 child-weeks.<sup>15</sup>

There is a higher incidence of ARI was found among children living in houses with inadequate status which was noted in table-2. Our results could be compared with Singh MP et al, Acharya D et al and SC Dharmage et al studies where all of which show an association between inappropriate housing status and incidence of ARI.<sup>2,4,16</sup> In this study area, 58.32% of the households had inadequate housing status. Absence of separate kitchen in the house and inadequate kitchen and bathroom smoke outlets generate a lot of toxic products might possibly accumulate at the indoors. This affects the local defences of the respiratory tract of children because of their longer indoor stay and makes them susceptible to ARI.

In the present study, ARI was seen 45.78 percent in exclusive breast-fed children and 57.89 percent in children with breast feeding less than six months. In bottle fed children ARI was present in 47.86 percent cases in comparison to 45.22 percent in breast-fed children. A study conducted by Bipin et al displayed that occurrence of ARI was reportedly higher in children of mothers who continued breast feeding for up to 3 months (40%) as compared to breastfeeding up to 6, 9 and 12 months (29.7%, 27.2% and 30.4% respectively).<sup>17</sup> Shatha et al reported that breastfeeding provides protection against ARI, as formula fed infants were found to have 2.7 times higher risk of ARI.<sup>18</sup> Arifeen et al from Bangladesh observed that when compared to exclusive breastfeeding in first few months of life, partial or no breastfeeding was associated with 2.23-fold higher risk of infant deaths resulting from all

causes and 2.40- and 3.94-fold higher risk of deaths attributable to ARI and diarrhoea respectively.<sup>19</sup>

## CONCLUSION

ARI is reported to be a public health concern killing millions of our future citizens across the country. The study would be an eye-opener for further research in those areas with poor health care settings due to fewer resources. The risk factors that had been derived would help the planners and program managers to carefully choose and plan approaches in curbing the menace. The present study had identified a high prevalence of ARI among under-five years old. In our study population, ARI was significantly associated with housing status and infants and child feeding habits.

## REFERENCES

1. Nilanjan MK. A longitudinal study on ARI among rural under fives. *Indian Journal of Community Medicine*. 2001;26:8-11.
2. Singh MP, Nayar S. Magnitude of Acute Respiratory Infections in under five children. *Journal of Communicable diseases*. 1996;28(4):273-78.
3. ReddaiahVP, Kapoor SK. Acute respiratory infections in rural under fives. *Indian J Paediatr*. 1988;55:424-26.
4. Acharya D, et al. Acute respiratory infections in children: A community based longitudinal study in south India. *Indian Journal of Public health*. 2003;47:7-12.
5. Savitha MR, et al. Modifiable risk factors for acute lower respiratory tract infections in children. *Proceedings from Karnataska State Paediatrics conference, 2005 Dec 29-30; Gulbarga, India*.
6. Reddaiah VP, Kapoor SK. Epidemiology of Pneumonia in rural under fives. *Indian J Paediatr*. 1990;57:701-04.
7. Gupta A, Sarker G, Pal R. Risk correlates of acute respiratory infections in children under five years of age in slums of Bankura, West Bengal. *Indian Journal of Child Health*. 2014; 1(1):1-6.
8. Goel K, Ahmad S, Agarwal G, Goel P, Kumar V. A Cross Sectional Study on Prevalence of Acute Respiratory Infections(ARI) in Under-Five Children of Meerut District, India. *J Community Med Health Educ* 2:176.
9. Ghai OP. *Essential Paediatrics*. 6th Ed. New Delhi: Dr. O.P. Ghai, 2005.44 pp, 102 pp, 352 pp.
10. Kapoor SK, Reddaiah VP, Murthy GVS. Knowledge, Attitude and Practices regarding Acute Respiratory Infections. *Indian J Paediatr*. 1990;57:533-35.
11. Gupta KB, Walia BNS. A longitudinal study of morbidity in children in a rural area of Punjab. *Indian J Paediatr*. 1980;47:297-301.
12. Madhav Murali S, et al. A study of two-weekly incidence of ARI in under-five children of rural area of Alwar (Rajasthan). *J Com Dis*. 1990;22(4):243-46.
13. Chhabra P, et al. Magnitude of acute respiratory infections in under fives. *Indian Paediatrics*. 1993;30:1315-18.
14. Zaman K, et al. Acute respiratory infections in children: A community based longitudinal study in rural Bangladesh. *Journal of Tropical Paediatrics*. 1997;43: 133-36.

15. BOSTID researchers. The Epidemiology of Acute Respiratory Tract Infection in Young Children: Comparison of findings from several developing Countries. *Reviews of Infectious Diseases*. 1990;12(8):S870-87.
16. Dharmage SC, Rajapaksa LC, Fernando DN. Risk factors of acute lower respiratory tract infections in children under five years of age. *Southeast Asian Journal of Tropical Medicine and Public Health*. 1996;27(1):107-10.
17. Prajapati B, Talsania N, Lala MK, Sonaliya KN. A study of risk factors of acute respiratory tract infection (ARI) of under five age group in urban and rural communities of Ahmedabad district, Gujarat. *Health Line*. 2012;3(1):16-20.
18. Al-Sharbatti SS, Al-Jumaa LI. Infant feeding patterns and risk of acute respiratory infections in Baghdad/Iraq. *Italian Journal of Public Health*. 2012;9(3):7534-9.
19. Arifeen S, Black RE, Antelman G, Baqui A, Caulfield L, Becker S. Exclusive Breastfeeding Reduces Acute Respiratory Infection and Diarrhea Deaths Among Infants in Dhaka Slums. *Pediatrics*. 2001;108(4):E67.