ORIGINAL ARTICLE

STUDY ON PREVALENCE OF ARI (ACUTE RESPIRATORY INFECTION) AMONG UNDER-FIVE CHILDREN OF A RURAL AREA OF MANIPUR, THANGA: A CROSS-SECTIONAL STUDY

H. Nirendrakumar Singh¹, T. Hemchand Singh²

HOW TO CITE THIS ARTICLE:

H. Nirendrakumar Singh, T. Hemchand Singh. "Study on Prevalence of ARI (Acute Respiratory Infection) among Under-Five Children of a Rural Area of Manipur, Thanga: A Cross-Sectional Study". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 07, February 17; Page: 1757-1762, DOI: 10.14260/jemds/2014/2054

ABSTRACT: BACKGROUND: Children are the most precious assets of a country and their health status is highly reliable index of nation's health. **OBJECTIVE:** To determine prevalence of ARI among under-five children in the area and to assess its association with some selected variables. **METHODS:** A cross-sectional study was conducted among under-five children in the village from September to December 2007. A sample size of 390 (13*30) was selected and participants were examined after interviewing mother or care taker. Chi square test was applied for significance in the difference. **RESULTS:** Out of 390 under-five children 92.3% were sick in the last 3 months of visit. Majority of them (83.6%) were suffering from ARI with episode of 2.6/child in last 3 months. **CONCLUSION:** The commonest morbidity in under-five children is ARI.

KEYWORDS: Literate, overcrowding, general cleanliness of house, episodes, ARI.

INTRODUCTION: The health status of children is highly reliable index of nation's health and is the most precious assets of a country and no country can afford to neglect the rights and health needs of a child. Of 2.2 billion children in the world, UNICEF estimates that 1.9 billion lived in developing world; one billion of it lived in poverty & deprived of at least one of seven amenities considered to be basic rights as shelter, water, sanitation, schooling, information, health care and food.¹ Major causes of deaths in the age group 0-5 years are preventable.² The seasonal patterns of morbidities in preschool children in Lucknow as annual incidence rate per 100 child year for respiratory, diarrhea, skin disease and pneumonia were 167, 79.9, 30.6 and 9.6.³ The present study is conducted at Thanga Village, Bishnupur District, Manipur to see ARI morbidity among under-five children in the area.

MATERIALS AND METHODS: A cross sectional study was carried out during September to December 2007, among under-five children at Thanga Village – only island in Loktak Lake, the only fresh water lake in the North East India. Sample size was calculated based on 50% prevalence rate⁴ as similar study considering the methodology and recall period of three months were lacking. The calculated sample size is 331 at 11% allowable error and at 5% significance level, however rounded to 390 as there are 13 leikais in the village. Sampling frame was obtained from AWW of each leikai (cluster) and selects 30 children randomly from each cluster. Verbal consent was sought before involvement.

Literate mothers are those who can read and write with understanding. Criteria for overcrowding were adopted according to Park K 19th edition, 2007 according to available floor space area of the room per person.⁵ General cleanliness of the house was assessed based upon observational findings on fly density, refuse disposal, drainage system and mosquito breeding.⁶ Nutritional status is assessed based on WHO weight for age criteria (2006).⁷ Episodes are calculated

ORIGINAL ARTICLE

based on at least period of three consecutive days free from symptoms and signs between next attacks. Chi-square test was applied to test for significance in the difference and SPSS 20 version and Epi Info Version 7 were used for analysis.

RESULTS: Table 1 show that out of 390 children, most of them are living in nuclear family (91.5%), kutcha type of house (96.7%) and 77.2% of them also lived overcrowded as per available floor space area. Sex distribution according to age categories i.e. < 1yrs, 1-3yrs and 3-5 yrs. are more or less similar in rate. On observatory finding of general cleanliness of house including courtyard 85.9% of children are satisfactory while 79.8% children were of adequate nutritional status. 80.5% children have per capita income $\leq$ Rs 1000/month.

Table 2 shows that acute respiratory infection (ARI) is the commonest disease in the community contributing 83.6% of children at least once in three months with episode of 2.61 per child however diarrhea is the next commonest cause with 34.9% prevalence during the period with 2.03 episodes per child per 3 months.

Table 3 shows the relationship between ARI morbidity and type of the houses of the study population during past 3 months. Most of the houses, 377 of the study population belonged to Kutcha type while 11 and 2 houses are Semipucca and Pucca type respectively. It is found from the table that the occurrence of ARI illness to children living in Kutcha type of house as compared to Pucca+Semipucca type of houses is not different (83.6% vs. 84.6%). Regarding the no. of episodes of ARI according to type of houses, out of 326 children those living in Kutcha type of houses suffered frequent attacks of ARI i.e. 63.5% during lasts 3 months as compared to children living in Pucca+Semipucca type of houses. On the contrary, out of 326 children having illness last 3 months 72.7% (8) children living in Pucca+Semipucca type of houses have only one episode during the period. The relationship is found to be statistically significant (p-value=0.034).

From table 4 it is observed that 301(77.2%) children are living in room overcrowded per space area. Out of 301 children living overcrowded, 260 (86.4%) of them have one or more attack of ARI during past 3 months from the day of visit whereas 74.2% (66) of children living without overcrowding per space area have attack of ARI during the period. The difference is found to be statistically significant (p-value=0.006).

DISCUSSION: ARI was the commonest disease (83.6%) of the children during the period of three months followed by diarrhea (34.9%), caries (16.9%), dysentery (6.7%), scabies (6.7%), worm infestation (5.9%), conjunctivitis (5.9%), measles (3.8%), pneumonia (1.8%) etc. The average episodes of ARI and diarrhea are 2.61 and 2.03 per 3 months period. Similar observations were found in studies conducted by Yurembam M et al (1993)⁶, Mukherjee DK (1979)⁸, Nwolisa CE et al (2005)⁹ and Bisrat F et al (1995)¹⁰ where ARI was the commonest disease followed by diarrhea, however the prevalence rate of the two diseases are comparatively high in the present study. Reasons may be the unique topographical condition of the area where drainage system and latrine outlets were drained to Loktak Lake which is the main source of drinking water. Moreover, personal hygiene, household cleanliness and environmental sanitary conditions are poor. Houses are densely built and most living rooms were overcrowded. To make conditions worst, there was an episode of flood one month before the study.

ORIGINAL ARTICLE

From table 3 it is observed that type of houses has no relationship with ARI morbidity ($p=0.78$) whereas there is significantly increased episodes of ARI in those children living in kutcha type of houses (62.3%) as compared to children living in pucca and semipucca house (37.7%). The relationship is statistically significant ($p\text{-value}=0.034$). The possible reason could be that most of the children who had at least an attack in the last 3 months had another episode in the duration. However, the relationship has an indication that there is positive association of ARI with kutcha type of house as compared to better housing.

Maximum, 86.4% of children living in overcrowded room have ARI morbidity as compared to other children living without overcrowding (74.2%). Overcrowding of living room of study population per space area has significant positive relationship ($p\text{-value}=0.006$) with ARI morbidity. Similar association is reported by Bipin Prajapati¹¹.

Strength of the study: There is internal validity; regarding ARI, external validity can be considered.

Limitation: Recall period of three months could lead to memory bias and study design itself is also a limitation.

CONCLUSION: The commonest disease in under-five children is ARI which is present in children living in overcrowded house and/ or poor type of housing. Study with better design is recommended.

REFERENCES:

1. UNICEF. Investing in children. South-East Asia Report: 2004; 3-13.
2. Sharma S and Gupta B.P. Prevalence of 'At Risk' Under-five Children in a Rural Area. Indian Journal of Community Medicine 2005; 30(1): 30-31.
3. Awasthi S and Pande V.K. Seasonal pattern of morbidities in preschool slum Children in Lucknow, North India. Ind Pediatr; 1997; 34:987-993.
4. L. Naing, T. Winn, B. N Rusli. Practical Issues in Calculating the Sample Size for Prevalence Studies. Archives of Orofacial Sciences; 2006; 1:9-14.
5. Park K. Parks Text Book of Preventive and Social Medicine. 19th Edn. Jabalpur. M/s Banarsidas Bhanot. 2007.
6. Yurembam M, Rajkumar N, Pukhrambam B, Hijam R, K. I. and Rungsung S, Study of morbidity pattern among pre-school Children of urban & rural areas of Manipur [Departmental research work]. Dept. of Community Medicine, RIMS; 1992.
7. WHO. WHO Child Growth Standards, weight-for-age; 2006.
8. Mukherjee D.K. A longitudinal study of the pattern of illness in under privileged Bengali Hindu Children from birth up to 18 months of age. Ind. Jour. of Pub. Health 1979; 23(1):17-23.
9. Nwolisa CE and Erinangha Au. Pattern of morbidity among pre- school children attending the children's outpatient clinic of Federal Medical Center Owerri, Nigeria. Niger J. Med 2005; 14(4):378-80.
10. Bisrat F, Berhane Y, Mamo A, Asefa E. Morbidity Pattern among refugees in Eastern Ethiopia. East Afr Med J. 1995; 72(11):728-30.

ORIGINAL ARTICLE

11. Bipin Prajapati, Nitiben Talsania, Sonaliya KN. A study on prevalence of Acute Respiratory Tract Infection (ARI) in under-five children in urban and rural communities of Ahmedabad District, Gujarat. National Journal of Community Medicine. 2011; 2(2):255-259.

Characteristics	Number (%)	Mean (SD)
Type of family Nuclear Joint	357 (91.5) 33 (8.5)	NA
Type of house Kutchha Pucca+ Semipucca	377 (96.7) 13 (3.3)	
Overcrowding per space area Yes No	301 (77.2) 89 (22.8)	
General cleanliness of house including courtyard – observatory findings Poor Satisfactory	55 (14.1) 335 (85.9)	
Nutritional status Low Normal	79 (20.3) 311 (79.8)	
Literacy status of mother Illiterate Literate	82 (21) 308 (79)	
Per capita income in Rs per month ≤1000 >1000	314 (80.5) 76 (19.5)	730.27 (455.8)
Age in year <1 1-2 2-3 3-4 4-5	77 (19.7) 69 (17.7) 66 (16.9) 94 (24.1) 84 (21.5)	30.16 (17.28)
Birth order 1 2 3 4 ≥ 5	139 (35.6) 122 (31.3) 74 (19) 34 (8.7) 21 (5.4)	2.19 (1.22)

Table 1: Showing different characteristics of under-five children

ORIGINAL ARTICLE

Sl. No.	Type of diseases	No. of children affected (%)	Frequency	Episodes per child in 3 months
1	ARI	326(83.6)	852	2.6
2	Diarrhea	136(34.9)	276	2
3	Caries	66(16.9)	66	1
4	Dysentery	26(6.7)	30	1.15
5	Scabies	26(6.7)	27	1.04
6	Worm infestation	23(5.9)	24	1.04
7	Conjunctivitis	23(5.9)	23	1
8	Measles	15(3.8)	15	1

Table 2: Distribution of diseases encountered in the study population with episodes during last 3 months period (n=390)

ARI morbidity	Type of house			Total	p-value (Yates correction)
	Kutcha	Semipucca	Pucca		
Yes	315(83.6)	10(90.9)	1(50)	326(83.6)	0.78
No	62(16.4)	1(9.1)	1(50)	64(16.4)	
Total	377(96.7)	11(2.8)	2(0.5)	390(100)	
Episodes 1	115(36.5)	7(70)	1	123(37.7)	0.034
≥2	200(63.5)	3(30)	0	203(62.3)	
Total	315(96.6)	10(3.1)	1(0.3)	326(100)	

Table 3: Distribution of ARI morbidity according to type of houses

(For analysis columns for semipucca and pucca are clubbed together.)

(Figures in the parentheses indicate percentages to respective total)

ARI morbidity	Overcrowding per space area		Total
	No	Yes	
Yes	66(74.2)	260(86.4)	326(83.6)
No	23(25.8)	41(13.6)	64(16.4)
Total	89(22.8)	301(77.2)	390(100)

Table 4: Distribution of ARI morbidity of the study population according to overcrowding per space area

(Figures in the parentheses indicate percentages to respective total)

$\chi^2 = 7.479$, p-value=0.006

ORIGINAL ARTICLE

AUTHORS:

1. H. Nirendrakumar Singh
2. T. Hemchand Singh

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, JNIMS, Porompat, Imphal.
2. Assistant Professor, Department of Psychiatry, JNIMS, Porompat, Imphal.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. H. Nirendrakumar Singh,
Thangmeiband,
Lairenhanjaba Leikai,
Near Fishery Gate,
Lamphel, Imphal,
Manipur - 795004
E-mail:hnirendra10@gmail.com

Date of Submission: 28/01/2014.
Date of Peer Review: 29/01/2014.
Date of Acceptance: 03/02/2014.
Date of Publishing: 14/02/2014.