Prevalence And Factors Associated With Acute Respiratory Infection Among Under – Five Children In Selected Hospitals, Trichy

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ABSTRACT

Background: Acute respiratory infections (ARI) are one of the leading causes of under 5 mortalities globally. Acute respiratory infections of the airways from nostrils to the alveoli. ARIs can be categorized as upper respiratory tract infections and lower respiratory tract infections. It is the most common infectious disease in children under five years, with mild to severe manifestations.

Aim: To find out the prevalence and factors associated with acute respiratory infection among under – five children. **Methodology**: A cross – sectional study was carried out at Baby Hospital and Pugazhini Hospital at Trichy among under- 5 children attending Paediatric OPD. A total of 367 were selected using convenient sampling technique Ethical approval was obtained from the Institutional Ethics Review Board. Formal permission was obtained from Directors of the hospitals. Prior to data collection, written informed consent was obtained from the Participants. Data were collected by using pre -tested semi – structured tool through interview schedule were used.

Results: The study revealed that children who had symptoms of ARI, half of them had no pneumonia, 15.2% had pneumonia and 11.1 % had severe or very severe pneumonia. The study findings showed that, the variables significantly associated with gender, exclusive breast feeding, no of siblings, religion followed by family, type of family, educational status of the father and mother, occupational status of the mother, socio- economic status of the family, parental smoking and presence of RTI in family.

Conclusion: Parents and family members should be aware of preventing the acute respiratory tract infection by addressing and reducing the factors contributing to Acute Respiratory Infection.

Keywords: *Acute Respiratory Infection, Pneumonia, Prevalence*

1. INTRODUCTION

Acute respiratory infections (ARI) are one of the leading causes of under 5 mortalities globally. Acute respiratory infections of the airways from nostrils to the alveoli. ARIs can be categorized as upper respiratory tract infections and lower respiratory tract infections.[1] It is the most common infectious disease in children under five years, with mild to severe manifestations. ARI is a leading cause of death among children under five. The mortality rate for ARI is very high among children under five, children, and the elderly, particularly in low – and middle- income countries, with up to four million (98%) dying each year worldwide.[2]

Risk factors for ARI in children under five are low birth weight (LBW), poor nutrition, lack of vitamin A and zinc supplements, non-exclusive breastfeeding, air pollution in the room from cigarette smoke or burning smoke from the kitchen, mother's education level and family socioeconomic status.[3]

A study at Bamenda Hospital Cameroon on 512 children under five years explained that the risk factors for ARI were children infected with HIV, malnutrition, low maternal education, passive smoking, exposure to cigarette smoke and physical contact with people with ARI.[4] Numerous studies have found that socioeconomic and other characteristics such as the child's age, household income, environmental conditions, parental education, maternal age, and other factors are linked to ARI.[5-7]

The availability of data on the prevalence and risk factors of ARIs is very important because achieving sustainable development goal on improving health and wellbeing will depend on the existing efforts to prevent and control ARIs in all

WHO regions.[8,9] Many socio- cultural, demographic, and environmental risk factors predispose children less than 5 years to acquire Respiratory tract infections.

Thus, this study aims to determine the prevalence and factors associated with acute respiratory infection among under – five children at selected hospitals, Trichy District.

2. MATERIALS AND METHODS

Aim, design, setting

A cross-sectional study was carried to assess the prevalence of Acute Respiratory Infection (ARI) and to identify the factors associated with ARI at two hospitals, Trichy; Baby Hospital & Pugazhini Hospital.

Study participants

Children attending the Pediatric Out Department of Baby Hospital and Pugazhini Hospital were selected as study participants. The inclusion criteria included: children aged under five visiting the hospital OPD for either respiratory or any other problems. The exclusion criteria were; children with clinically diagnoised bronchial asthma, repeated episode of wheeze, children with any co-morbidity or any other physical and/or intellectual disabilities.

Sampling Technique and sample size

A convenient sampling technique was adopted for this study. A similar study was conducted at Nepal medical college teaching hospital and international friendship children's hospital reported the overall prevalence of ARI to be 60.8%. So, using this prevalence with an allowable error of 5% at a confidence level of 95%, the sample size was estimated to be 367 participants after adding a non- response rate of 10%.

Variables under the study

Dependent variable: Acute Respiratory Infection (ARI)

Demographic variables: Age and sex of the child, birth weight and birth status of the child, immunization status of the child, Nutritional status, Exclusive breastfeeding, month of weaning, no of siblings, religion, type of family, educational status of the father and mother, occupational status of the mother and father, socio – economic status of the family, type of house, place of cooking, type of cooking fuel used, presence of child in kitchen while cooking, parental smoking, adequacy of cross – ventilation, over-crowding, presence of RTI in a family.

Instruments

Pretested semi-structured questionnaire was used which was developed after extensive literature review and consulting with subject expert. The tool was pretested among 30 participants for validation before the final administration. The reliability of the tool was calculated by using test- re-test method, which was 0.89.

Part I: Demographic details of the Child's family

Age of the attendee, gender of the attendee, caste/ ethnicity and religion of children's family, information on the type of family, family size and socio – economic status.

Part II: Environmental Characteristics:
It includes information as the type of house, number of family members, ventilation, place of cooking, presence of child in kitchen while cooking, history of smoking in a family within the living areas.

Part III: Child related information

It includes information of the child as age, sex of the child, birth status, birth weight, anthropometric measurement, exclusive breast – feeding, the month of weaning and immunization status.

Part IV: Prevalence of ARI

The prevalence of ARI was assessed by using revised WHO classification of childhood pneumonia at health facilities which is classified as no pneumonia, pneumonia and severe pneumonia.

Procedure of data collection

The data was collected from September 2024 to January 2025 in the OPD of Baby hospital Srirangam, Trichy and Pugazhini Hospital, Trichy through interview schedule after obtaining formal permission from the respective hospitals. The general information about the child and child's family were collected from the attendees of the children either mother or father of the child. The purpose of the study was explained to the participants. Written informed consent was obtained from the participants. Face to face interview was conducted using the pretested semi – structured questionnaires by the researchers themselves. After obtaining general information, anthropometric measurement and child was assessed for the presence of ARI as per WHO criteria. Children were recruited until the sample size was met.

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Ethical consideration

The study was approved by the Institutional Review Committee of SRMMC&RC, Trichy. Permission for data collection was obtained from the Director of the Hospital from the respective hospitals. Written informed consent was taken from the parent of children attending paediatric OPD prior to data collection and all the information were kept confidential.

Statistical analysis: Statistical analysis was performed using the Statistical Package for Social Sciences Programme (SPSS) version 17.0. Descriptive statistics was used to describe the demographic variables. Chi square test was used to find the association between the prevalence of ARI and the demographic variables.

3. RESULTS

Out of 367, 52.4% (193) of children with ARI were participated in the study. Interview was carried with the parents, of which most of them were mothers or fathers of the child. The prevalence of ARI was depicted in Fig.1. Association of selected demographic variables with acute respiratory infection were depicted in Table 1.

Figure 1: Prevalence of ARI
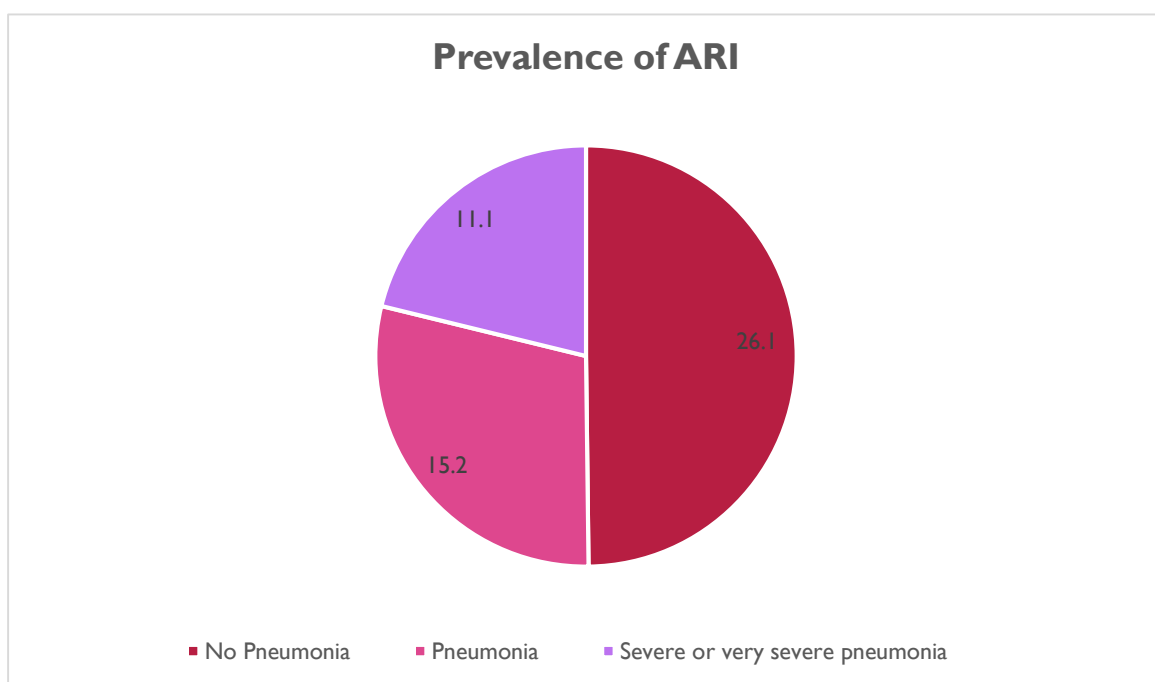
Table 1: Association between the prevalence of pneumonia and with their demographic variables N = 193

Demographic Characteristics	Prevalence of ARI			Chi Square Value
	No Pneumonia	Pneumonia	Very severe pneumonia	
1. Age of the child	52	35	22	$\chi^2 = 1.1674$
a. Less than 24 months	44	21	19	df = 2
b. Greater than 24 months				p = 0.280019
				NS
2. Sex of the child				

	a. Male b. Female	46 50	23 33	28 13	χ^2 = 7.4352 df = 2 p = .006396 S
3.	**Birth weight of the child** a. Normal or above b. Low birth weight	86 10	48 8	33 8	χ^2 = 2.0839 df = 2 p =.148859 NS
4.	**Birth status of the child** a. Term b. Pre - Term	82 12	50 6	37 7	χ^2 = 0.8514 df = 2 p = 0.35615 NS
5.	**Immunization status** a. Completed as per age b. Not completed as per age	40 56	24 32	16 25	χ^2 = 0.1469 df = 2 p = 0.701516 NS
6.	**Nutritional status** a. Normal b. Under - nutrition	90 6	54 2	39 2	χ^2 = 0.5263 df = 2 p = .468167 NS
7.	**Exclusive Breastfeeding** a. Exclusively breastfed b. Non – exclusively breastfed	76 20	35 21	23 18	χ^2 = 8.9887 df = 2 p = 0.002717 S
8.	**Month of weaning** a. After 6 months b. Before 6 months	73 23	38 18	25 15	χ^2 = 2.8451 df = 2 p = 091653 NS
9.	**No of Siblings** a. No sibling b. One sibling c. Two siblings	36 54 6	26 28 2	28 12 1	χ^2 = 11.2605 df = 4 p =.000792 S
10.	**Religion followed by family** a. Hindu b. Christian	36 30 16	25 27 4	14 10 17	 $\chi2$ = 23.8583 df = 6

c. Muslim d. others	0	0	0	p =.00001 S
11. Type of family **a. Nuclear** **b. Joint or extended**	88 8	50 6	31 10	χ2 = 7.0172 df = 2 p = .008073 S
12. Educational status of the father a. Illiterate b. Literate	36 60	23 33	27 14	χ2 = 9.738 df = 2 p = 0.007681 S
13. Educational status of the mother a. Illiterate b. Literate	62 34	23 33	28 13	χ2 = 10.0928 df = 2 p = 0.006435 S
14. Occupational status of the mother **a. Unemployed** **b. Employed**	60 34	20 36	16 25	χ2 = 12.5422 df = 2 p = 0.00189 S
15. Occupational status of the father a. Unemployed b. Employed	2 92	1 56	1 40	χ2 = 0.0499 df = 2 p = 0.975359 NS
16. Socio – economic status of the family a. Upper b. Middle c. Lower	18 44 34	15 32 9	12 23 6	χ2 = 10.4715 df = 4 p = 0.005324 S
17. Type of House a. Kutcha b. Semi – pucca **c. Pucca**	12 43 41	11 30 15	9 21 11	χ2 = 6.137 df = 4 p = 0.046491 NS
18. Place of cooking a. Within bedroom or living hall **b. Separated**	91 5	52 4	37 4	χ2 = 0.9667 df = 2 p = 0.616721 NS

19. Type of cooking & fuel used
 	
  a. LPG
  b. Firewood & others
	94
	2
		55
		1
			40
			1
				$\chi2 = 0.0499$
				df = 2
				p = . 975359
				NS

20. Presence of the child while cooking
 	
  a. Yes
  b. No
	
	4
	92
		
		2
		54
			
			2
			39
				$\chi2 = 0.1019$
				df = 2
				p = .950326
				NS

21. Parental smoking
 	
  a. Yes
  b. No
	18
	78
		30
		26
			20
			21
				$\chi2 = 22.9803$
				df = 2
				p = .00001
				S

22. Adequacy of cross – ventilation
 	
  a. Adequate
  b. In- adequate
	91
	5
		45
		11
			35
			6
				$\chi2 = 7.836$
				df = 2
				p = .019881
				NS

23. Overcrowding
 	
  a. Yes
  b. No
	15
	81
		12
		44
			9
			32
				$\chi2 = 1.1583$
				df = 2
				p = .560374
				NS

24. Presence of RTI in family
 	
  a. Yes
  b. No
	5
	91
		31
		25
			26
			15
				$\chi2 = 64.1692$
				df = 2
				p = 0.0001
				S

4. DISCUSSION

Prevalence of Acute Respiratory Infection (ARI)

The overall prevalence of ARI was 52.4 %. The prevalence is also higher than a study done in Gorkha Municipality, Nepal which showed 21.5% prevalence of ARI among under – five children. While, the study conducted on prevalence of ARI among under – five children in Kathmandu Valley showed 60.8% of the under – five children had ARI which is higher than the prevalence of current study.[10]

Among the children who had symptoms of ARI, half of them had no pneumonia, 15.2% had pneumonia and 11.1 % had severe or very severe pneumonia, while one of the studies done in India found 30.4% had no pneumonia, 16.1% had pneumonia, 14.3% had severe or very severe pneumonia.[10]

5. FACTORS ASSOCIATED WITH ARI AMONG UNDER – FIVE CHILDREN

The study findings showed that, the variables significantly associated were gender, exclusive breast feeding, no of siblings, religion followed by family, type of family, educational status of the father and mother, occupational status of the mother, socio- economic status of the family, parental smoking and presence of RTI in family. While another study has identified religion, presence of the child in kitchen while cooking and presence of RTI in family.[11]

The present study shows no significant association of age, birth weight of the child, birth status of the child, immunization, nutrition, month of weaning, occupational status of the father, type of house, place of cooking, type of cooking, presence of the child while cooking, adequacy of cross – ventilation, overcrowding. While in another study have identified no significant association of age, sex, birth weight, immunization status, nutritional status and type of house.[12-13]

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6. CONCLUSION

Acute Respiratory Infection (ARI) is a major problem among under – five children. The prevalence of ARI among male child is more than that of female child. The prevalence was higher among child taking exclusive breast feeding. Children when exposed to smoking have greater chance of acquiring ARI. Similarly, when the family members have RTI, it could double the risk of ARI among the children. Case control design in the community settings is recommended to find out the major factors of ARI.

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