Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20200955

Epidemiological factors affecting acute respiratory infection in children admitted in paediatric ward, at Government Medical College and Hospital, Miraj

Sandip P. Suryawanshi¹, Ganesh S. Lokhande^{2*}, Jayshree D. Naik³, Priya B. Dhengre⁴

Received: 26 December 2019 Revised: 10 February 2020 Accepted: 11 February 2020

*Correspondence:

Dr. Ganesh S. Lokhande,

E-mail: dr.ganesh22@gmail.com

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ABSTRACT

Background: Acute respiratory infections (ARI) comprising of a group of respiratory diseases of varying etiology and severity is being increasingly recognized as a major public health problem particularly amongst children below five years of age. In all countries ARI is a leading cause of hospitalization and death. Therefore ARIs represent a large challenge in field of communicable diseases. The study was conducted with the objective to assess the sociodemographic, epidemiological and clinical profile of ARI cases.

Methods: A descriptive cross sectional, hospital based study was conducted at Government Medical College and Hospital. All children admitted with ARI in the paediatric ward during the study period of one calendar year.

Results: Maximum (53.13%) cases of ARI were from the age group <1 year. Males (60.80%) outnumbered the females (M:F ratio was 1.5:1). Month wise and season wise distribution of ARI cases showed that, most of the cases were admitted in the month of December (13.35%), followed by January (12.78%) and November (10.80%).

Conclusions: Prevalence of ARI cases as well as severity of the disease was more in participants less than 1 year of age.

Keywords: ARI, Malnutrition, Socio-economic class

INTRODUCTION

Acute respiratory infections (ARI) comprising of a group of respiratory diseases of varying etiology and severity is being increasingly recognized as a major public health problem particularly amongst children below five years of age. ARI continues to be the leading cause of acute illnesses worldwide and remains the most important cause of infant and young children mortality, accounting for about two million deaths each year and ranking first among causes of disability-adjusted life-years (DALYs) lost in developing countries. The populations most at risk

for developing a fatal respiratory disease are the very young, the elderly, and the immunocompromised.² In most countries, ARI occurs more frequently than any other acute illness, including diarrhea and other tropical diseases. In developing countries 30% of all patients consultation and 25% of all pediatric admission are of ARI. Most infections are limited to the upper respiratory tract and 5% involve the lower respiratory tract. A large proportion of ARI is present as pneumonia or bronchiolitis. Incidence of ARI is almost the same all over the world: 5-7 episodes per child per year in urban areas and 3-5 episodes in rural area.³ Mortality due to ARI is high in developing countries which may reach

¹Department of Public Health, ADHS Leprosy, Nasik, Dist Nasik, Maharashtra, India

²Department of Community Medicine, Government Medical College, Jalgaon, Maharashtra, India

³Department of Community Medicine Government Medical College, Miraj, Maharashtra, India

⁴Department of Community Medicine, Indira Gandhi Medical College, Nagpur, Maharashtra, India

1000 or more per 100000 live births compared to 30-40 per 100000 live births in industrialized nations. In all countries ARI is the leading cause of hospitalization and death. Therefore ARI represent a large challenge in field of communicable diseases.³ In spite of increasing public health importance, management and control of ARI remains a neglected entity in most of the National Maternal and Child Health (MCH) activities.⁴ Hence this study was planned to determine epidemiological and clinical profile of ARI in children admitted in the pediatric ward of the Government Medical College and Hospital, during study period.

METHODS

Present descriptive cross sectional, hospital based study was conducted in pediatric ward at Government Medical College and Hospital, Miraj, Maharashtra. The study sample comprised of "acute respiratory infection" (ARI) cases admitted in pediatric ward at Govt. Medical College and Hospital, Miraj during the study period of one calendar year (i.e. January 2009 to December 2009) were enrolled for the study.

Inclusion criteria

Children admitted with ARI in paediatric ward at Government Medical College and Hospital during study period.

Exclusion criteria

Patients who had taken discharge against medical advice or who had absconded after admission in the hospital and caretaker or parents accompanying the child not willing to participate or cooperate were excluded.

Ethical clearance for this study was accorded by Institutional ethical committee. Total sample size was 352. All cases of ARI admitted in pediatric ward at Govt. Medical College and Hospital were examined and interview of the person accompanying the child; preferably the mother, was taken on the same day. The information regarding the study variables was recorded on predesigned, pretested questionnaire. Thorough clinical examination of child was undertaken after the interview was over. Data was entered in Microsoft excel sheet and analysis was done using Statistical software SPSS. Mean, standard deviation and c2 test were used for statistical analysis.

RESULTS

Out of total 352 cases studied, maximum 187 (53.13%) cases of ARI were in the age group of <1 year, M:F Ratio was 1.5:1. 240 (68.18%) cases were from urban area and remaining 112 (31.82%) cases were from rural area, 240 (68.18%) cases were Hindu, 94 (26.70%) cases were Muslim, 4 (1.14%) cases were Christian and 14 (3.98%) cases were Buddhist, 134 (38.07%) cases belonged to

nuclear family, 177 (50.28%) cases belonged to joint family and remaining 41 (11.65%) cases belonged to three generation family. 1 (0.28%) case was from upper socio-economic class, 6 (1.71%) cases were from upper middle socio-economic class, 115 (32.67%) cases were from lower middle socio-economic class, 151 (42.90%) cases were from upper lower socio-economic class and 79 (22.44%) cases were from lower socio-economic class as shown in Table 1.

Table 1: Socio-demographic and economic profile of the study group.

Profile	Classification of factors	No. of cases	Percentage (%)
Age (yrs)	<1 year	187	53.13
	1-5 years	115	32.67
	>5 years	50	14.2
Gender	Male	214	60.8
	Female	138	39.2
Residence	Urban	240	68.18
Residence	Rural	112	31.82
Religion	Hindu	240	68.18
	Muslim	94	26.7
	Christian	4	1.14
	Buddhist	14	3.98
Type of family	Nuclear family	134	38.07
	Joint family	177	50.28
	Three generation family	41	11.65
	I Upper class	1	0.28
Socio- economic status	II Upper middle class	6	1.71
	III Lower middle class	115	32.67
	IV Upper lower class	151	42.9
	V Lower class	79	22.44

322 (91.48%) cases had cough, 287(81.53%) had fever, running nose/cold was present in 268 (76.14%) cases, breathlessness was present in 186 (52.84%) cases while 20 (5.68%) cases were unable to feed/ drink. Coryza was present in 281 (79.83%) cases. Crepitation was present in 198 (56.25%) cases; while 101 (28.69%) cases had rhonchi. Chest indrawing was present in 48 (13.64%) cases and ear discharge was present in 31 (8.81%) cases.

302 children less than 5 years of age were classified according to WHO classification of ARI. Table 2 shows the distribution of under-five cases according to severity as per WHO classification. Out of 302 under-five cases, 22 (7.29%) cases were classified as "very severe disease", 48 (15.89%) cases as "severe pneumonia", 172 (56.95%) cases as "pneumonia" and 60 (19.87%) cases as "no pneumonia" (cough or cold). When severity of illness was considered with age, the difference was statistically significant.

Table 2: Distribution of cases according to ARI severity* (n=302).

Severity of	<1 year		1-5 years		Total	
ARI	No	%	No	%	No	%
Very severe disease	15	68.18	7	31.82	22	100
Severe pneumonia	28	58.33	20	41.67	48	100
Pneumonia	116	67.44	56	32.56	172	100
No pneumonia	28	46.67	32	53.33	60	100
Total	187	61.92	115	38.08	302	100

 χ^2 =9.43, df=3, p=0.02408.

The mean duration of hospital stay was 5.84 days, with S.D. of 3.54 days. 160 (45.45%) cases had duration of complaints for 5-8 days before hospitalization, of which 119 (74.38%) cases had hospital stay \leq 7 days, and 41 (25.62%) cases had hospital stay \geq 7 days. 89 (25.29%) cases had duration of complaints for >8 days before hospitalization, of which 50 (56.18%) cases had hospital stay \leq 7 days and 39 (43.82%) cases had hospital stay \geq 7 days. Table 3 shows that statistically significant association was observed between the duration of complaints before hospitalization and the duration of hospital stay.

Table 3: Relationship of duration of complaints before hospitalization with hospital stay in patients.

Duration of	Duration of hospital stay			
complaints	≤7 days	>7 days	Total	
before hospitalization	No. (%)	No. (%)	No. (%)	
≤4 days	87 (84.47)	16 (15.53)	103 (100)	
5-8 days	119 (74.38)	41 (25.62)	160 (100)	
>8 days	50 (56.18)	39 (43.82)	89 (100)	
Total	256 (72.73)	96 (27.27)	352 (100)	

 χ^2 =17.43, df=2, p±0.001.

Most of the cases were admitted in the month December i.e. 47 (13.35%), followed by January 45 (12.78%) and November 38 (10.80%). Least number of cases i.e. 19 (5.40%) were admitted in April.

DISCUSSION

In the present study, it was observed that maximum 187 (53.13%) cases of ARI were in the age group of <1 year. this age spurt in infancy was observed by Puri et al, Jain et al, Broor et al, Bharti et al.⁵⁻⁸

Male cases of ARI (60.80%) outnumbered the female cases (39.20%). Male female ratio was 1.5:1. Similar observations were made by studies conducted by Sehgal et al, Baqui et al.^{9,10} Higher predilection of male sex for ARI may be due to greater susceptibility and exposure to infection or due to higher likelihood of male children

being brought for medical care cannot be ascertained. This could also be due to higher rates of care seeking for male children than for female children.

Maximum cases of ARI i.e. 230 (65.34%) were from lower socio-economic class. Sahu S.K et al, Bharti B et al, Savitha MR et al also revealed similar findings.^{8,11,12} Cough was the most common symptom followed by fever and running nose.

These observations were comparable with studies conducted by Magotra et al, Tambe MP et al, Gupta N et al. ¹³⁻¹⁵ Kumar also observed that cough (in 100% cases) was the hallmark of ARI in children. ¹⁶ The "cough" has been the hallmark of ARI and it has rightly been suggested by WHO as the main guideline symptom of ARI for peripheral workers.

56.95% under-five cases were in the 'pneumonia group'. While 7.28% cases were from 'very severe disease' followed by 15.89% cases from 'severe pneumonia' and 19.87% cases had 'no pneumonia'. Similar observations were made by various studies conducted by Kanchi et al, Yousif et al.^{3,17}

Mean duration of hospital stay of 5.84±3.54 days was similar to the findings of Ghazal et al and Sahu et al. 11,18 Most of the patients required hospital stay for less than 7 days indicates that they responded well to the chemotherapy and hospital management.

It was observed that patients who reported late to the hospital or had complaints for a longer duration before hospitalization also had longer duration of hospital stay. It is statistically highly significant. Possible reason may be that the late reporting of cases without interventions increases the severity of disease requiring more time for the recovery and thus increasing the hospital stay.

Table 4: Distribution of cases according to age and outcome.

	Age group (in years)			Total
Outcome	0-1	1-5	>5	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Cured	173	109	48	330
	(92.51)	(94.78)	(96.00)	(93.75)
Death	14 (7.49)	6 (5.23)	2 (4.00)	22 (6.25)
Total	187	115	50	352
	(100)	(100)	(100)	(100)

 χ^2 =1.129, df=2, p=0.569.

It was revealed that, out of total 352 cases, 330 (94.60%) cases were cured and 22 (6.25%) cases died due to ARI. from the age group 0-1 year out of 187 cases, 173 (92.51%) cured from ARI and 14 (7.49%) died due to ARI. Similarly from the age 1-5 years, out of 115 cases, 109 (94.78%) cured from ARI and 6 (5.23%) died due to ARI. similarly from the age >5 years, out of 50 cases, 48

(96.00%) were cured and 2 (4.00%) died due to ARI as shown in Table 4.

CONCLUSION

From the above observations it can be concluded that, maximum cases of ARI were in the age group of <1 year, males were affected more compared to females and most of the participants were from urban area. Most of the participants belong to joint family and upper lower and lower socio-economic class. Very severe disease, severe pneumonia and pneumonia was more prevalent in less than 1 year age group compared to children between 1-5 year age group and the difference was statistically significant. Duration of stay in hospital was less if duration of complaint was less and the difference observed was statistically significant. Outcome at the time of discharge was not affected by the age and difference found was not statistically significant. Thus age, gender, residence, type of family, socio-economic condition and duration of complaints were factors affects the course of acute respiratory illness in paediatric age group.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Suryawanshi SP, Lokhande GS, Naik JD, Dhengre PB. Epidemiological factors affecting acute respiratory infection in children admitted in paediatric ward, at Government Medical College and hospital, Miraj. Int J Community Med Public Health 2020;7:1003-6.