Original Research Article

A Cross-Sectional Study on Prevalence and Risk Factors Associated with Acute Respiratory Infections in Children below 5 Years Attending the Paediatric OP of Gandhi Hospital, Musheerabad, Telangana

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ABSTRACT

Introduction: Acute respiratory infections (ARIs) are the leading cause of death among children of less than 5 years age in India. It is a significant cause of morbidity and mortality and is the main reason for utilization of health services among children. Although most of the attacks are mild and self-limiting episodes, ARI is responsible for about 30-50 % visits to health facilities and for about 20- 40 % admissions to hospital. In the developing countries, seven out of 10 deaths happen due to ARI in under 5-year age group. In India, about 26.3 million cases of ARI were reported in 2011, with an incidence rate of about 2,173 cases per lakh population. Identification and intervention of major risk factors can reduce the burden of ARI among children. About 90% of ARI deaths are due to pneumonia, which is usually bacterial in origin.
Objective: The present study was conducted to estimate the prevalence of ARI in patients attending Pediatric OPD and to enumerate risk factors and find relationship between risk factors and ARI.
Material and methods A cross sectional study was conducted during January to April 2015 in the pediatric out - patient block of Gandhi hospital. A convenient sample of 250 children, who are less than 5 years of age, was taken. Pre designed, Semi structured questionnaire was used.
Results: The prevalence of ARI was found to be around 75.2%. Among them 30.8% were below 1 year of age and the around 69.2% were 1-5 years of age. Overcrowding, no history of immunization against Measles, absence of cross ventilation, passive smoking were found to be statistically significantly associated as risk factors for Acute respiratory Infections among children < 5 years of age.
Conclusions: Overcrowding, lack of immunization, absence of breast-feeding in the first six months of life, were observed to be important risk factors for development of ARI.

Keywords: Acute respiratory infections, Overcrowding, Gandhi Hospital.

INTRODUCTION

Acute respiratory tract infection is a major cause of morbidity and mortality in developing and also developed countries. In young children, ARI is responsible for an estimated 3.9 million deaths worldwide, with 90% deaths due to bacterial pneumonia. In the developing countries, seven out of 10 deaths happen due to ARI in under 5-year age group. [1]

In India, about 26.3 million cases of ARI were reported in 2011, with an incidence rate of about 2,173 cases per lakh population. Identification and intervention of major risk factors can reduce the burden of ARI among children. About 90% of ARI

deaths are due to pneumonia, which is usually bacterial in origin. [2] ARI is an infection of any part of the respiratory tract or any related structures including Para nasal sinuses, middle ear and pleural cavity. It includes all infections of less than 30 days duration except those in the middle ear where the duration of acute episode is less than 14 days. [1]

Pneumonia kills 1.8 million children less than five years of age every year, more than any other illness, in every region of the world. In spite of its huge toll, relatively few global resources are dedicated to tackling this child killer. In response to this situation, WHO and UNICEF developed the Global Action Plan for the prevention and control of Pneumonia (GAPP). The aim of the GAPP is to increase awareness of pneumonia as a major cause of child death and spur action to deal more effectively with the problem. [2]

ARI are classified into Acute Upper Respiratory tract Infections (AURI) and Acute Lower Respiratory tract Infections (ALRI).

Common pathogens causing ARI are:

Viral: Rhinovirus, Adenovirus, RSV, Para influenza and influenza virus, measles and corona virus

BACTERIAL: Bordetella, Corynebacterium, Haemophilus, Klebsiella, Legionella, Streptococcus pneumoniae and streptococcus pyogenes.

ARI is responsible for about 30-50 % visits to health facilities and for about 20- 40 % admissions to hospital. The DALYs lost due to ARI in South East Asia Region are about 3, 30, 26,000. [3]

Objectives:
1. To estimate the prevalence of ARI in patients attending Pediatric OP of Gandhi Hospital.
2. To enumerate the risk factors contributing to the cause of ARI.
3. To find the relation between risk factors and ARI.

MATERIALS AND METHODS
Study design: Cross sectional study.

Study Duration: January-April 2015.
Study area: Pediatric Outpatient block of Gandhi Hospital, Musheerabad, Telangana.
Sample size: A convenient sample of 250 children was taken.
Study Population: <5year children attending pediatric out-patient department.
Study tool: Pre designed, Semi structured questionnaire.
Data analysis: Data was analyzed using MS excel and SPSS software version 17.

RESULTS
In the total study population of 250 less than 5 year old children, 75.2% were found to be suffering from ARI. Among those suffering from ARI, 30.8% were below 1 year of age i.e., infants and 69.2% were 1-5 years of age. Almost 4.2% of study population went to Anganwadi and Primary health center as soon as the symptoms of ARI appeared for treatment. Around 55.7% came to Gandhi hospital, a tertiary health care unit while 40% went to private hospitals to seek treatment.

Prevalence of acute respiratory tract infections was related with few of the established risk factors and the following results were found.

Risk factors assessed in the study:
1. **Low birth weight**
Almost 79.4% of low birth weight babies had episodes of acute respiratory infection. Around 73.9% of normal weight babies also suffered from ARI. The difference of 5.5% was found to be statistically not significantly associated.
2. **Type of delivery**
Out of the total ARI positive cases about 60% were delivered normally while 40% were by a C-section. Type of delivery was found to have no relation with ARI statistically.
3. **Breastfeeding history**
Relationship between feeding of colostrum, exclusive breastfeeding and early age of weaning with development of ARI was assessed.
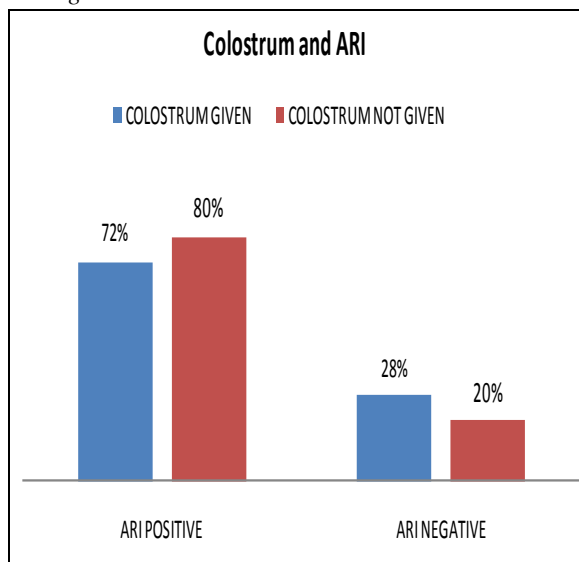
Figure I: Relationship between colostrum and ARI
Chi square value-2; p statistically not significant

It was observed that 80% of children who were not given colostrum and 72% of children given colostrum suffered from episodes of ARI. The difference of 8% was found to be statistically not significant.

Table I: Relationship between exclusive breastfeeding and ARI

Exclusive breastfeeding	ARI +VE (%)	ARI –VE (%)	TOTAL (%)
GIVEN	176 (75.8)	56 (24.2)	232 (100)
NOT GIVEN	12 (66.7)	6 (33.3)	18 (100)
TOTAL	188(75.2%)	62 (24.8%)	250(100%)

Chi square value -0.75, p statistically not significant

It was observed that almost 93% of mothers exclusively breast fed their babies. Around 75.8% of them suffered from ARI while almost 66.7% of the babies who were not breast fed also suffered from ARI. The difference was found to be statistically not significant.

4. Age of weaning and ARI

Almost 72.7% of infants who were weaned after 6 months developed ARI and 79.7% of children who were weaned less than 6 months of age developed ARI. The difference of 7% was found to be statistically not significant.

5. Nutritional supplementation of the pregnant mother and ARI

Mothers of 92.6% of the ARI positive children took proper nutritional supplements. There was no significant relation between an undernourished pregnant mother and development of ARI in the child.

6. Vaccination and ARI

Table II: Relationship between immunization and ARI

Immunization Schedule	ARI +VE (%)	ARI –VE (%)	Total (%)
Complete (for the age)	148 (71.8)	58 (28.2)	206 (100)
Incomplete (for the age)	40 (90.9)	4 (9.1)	44 (100)
Total	188 (75.2)	62 (24.8)	250(100)

Chi square -7.06; p statistically highly significant at <0.001

In the present study it was observed that partially immune children were found to be significantly at risk for developing ARI.

7. Malnutrition among children and ARI

Table III: Relationship between malnutrition among children and ARI

Malnutrition	ARI +VE (%)	ARI –VE (%)	Total (%)
Present	60 (93.7)	4 (6.3)	64 (100)
Absent	128 (68.8)	58 (31.2)	186 (100)
Total	188 (75.2)	62 (24.8)	250 (100)

Chi square – 15.8, p highly significant at <0.001

It was found that malnourished children had 24.9 times higher chances of developing ARI when compared to normally nourished children. The difference was found to be highly significant,

8. Overcrowding and ARI

Table IV: Relationship between overcrowding and ARI

Overcrowding	ARI +VE (%)	ARI –VE (%)	Total (%)
Present	112 (83.5)	22 (16.5)	134 (100)
Absent	76 (65.5)	40 (34.5)	116 (100)
Total	188 (75.2)	62 (24.8)	250 (100)

Chi square – 10.8; p highly significant at <0.001

It was observed that 83.5% of children residing in over- crowded houses suffered from ARI, while 65.5% of children suffered from ARI where overcrowding was absent. The difference of 18% was found to be statistically highly significant.

9. Cross ventilation and ARI

It was observed that 90.3% of children developed ARI when cross ventilation was absent and only 60.3% developed ARI when cross ventilation was

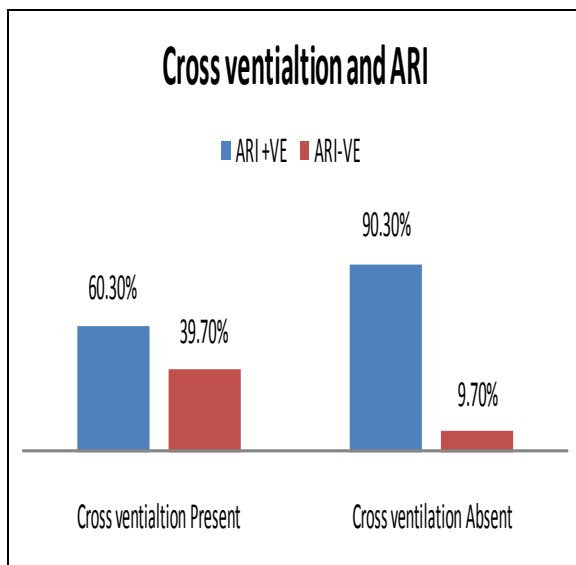present. The difference of 30% was found to be statistically highly significant (p<0.001).

Cross ventialtion and ARI

Figure II: relationship between Cross ventilation and ARI
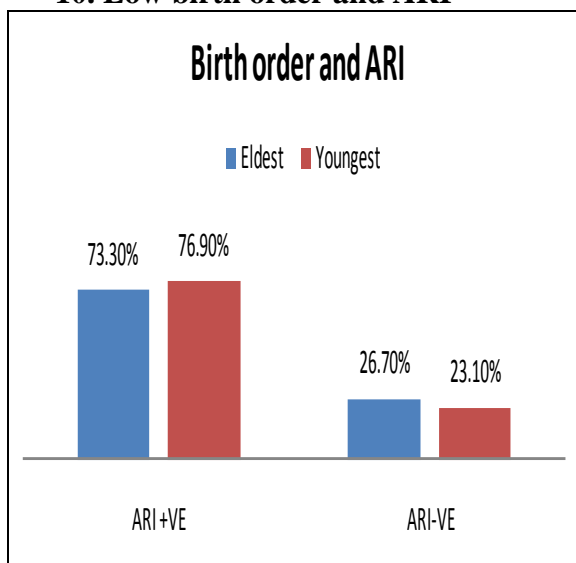
10. Low birth order and ARI

Figure III: Relationship between Low birth order and ARI

It was observed that 73.3% of elder children were ARI positive and 76.9% of youngest children were ARI positive. The meager difference of 3.6% was found to be statistically not significant (p > 0.05).

11. Passive smoking and ARI

It was observed that passive smoking history had no role in the development of ARI.

12. Kitchen fuel and ARI

In present study, 85.2% of ARI positive cases households of had access to clean and safe kitchen fuel.

13. Residential Area and ARI

Around 90.5% of ARI+VE cases were from urban locality and the rest from rural area. No significant association was found between residential area and development of ARI.

DISCUSSION

In the present study age was not found to be a significant risk factor. The present study finding differed with a study conducted by Prasad D Pore et al [3] where infants were found to be at risk of developing ARI.

In the present study Low birth weight babies showed no relationship in development of ARI. Comparatively in a study conducted by Dr. Thamer K Yousuf et al [4] showed that ARI cases had history of LBW.

No significance was found between feeding of colostrum or exclusive breastfeeding or early age of weaning and its relationship with ARI. Comparatively in a study conducted by Ceasar JA et al [4] infants who were not being breast fed was 17 times more likely to be admitted to hospital for pneumonia than those being breast fed without formula milk.

In the present study incomplete immunization was found to be a significant risk factor for ARI. Similar findings were found in a study conducted by Fatmi et al. [6]

In the present study malnourished children were at a higher risk of developing ARI when compared to normal children. This finding concurred with a study conducted by Prasad D Pore et al. [3] This may be due to the fact that infection leads to malnutrition and malnourished children are more prone for various infections.

In this study, majority of children living in poor conditions and over-crowded houses were found to be suffering from ARI. Similar findings were found in other studies. [7-10]

Absence of Cross ventilation was found to be a significant risk factor in the development of ARI. This relationship was also established by a study conducted by Suguna E et al [11] that showed absence of windows in sleeping room (OR = 3.0) as a risk factor for ARI.

Passive smoking was not found as a risk factor in the present study. This finding differed when compared to a study conducted by Suzuki M et al, [12] where environmental tobacco exposure was found to be a risk factor for ARI.

CONCLUSIONS & RECOMMENDATIONS

1. Prevalence of ARI was high despite many efforts through national health programmes.

Though there is improvement in the maternal nutrition, exclusive breast feeding, feeding colostrum, acute respiratory infections are still high which emphasizes that there is need for improvement in the socio economic status of the families to afford better living and better hygienic conditions which can prevent infections. Complete immunization especially against measles must be looked upon by the health workers to prevent ARI.

2. Pediatricians and general practitioners should take their role in the process of education of families particularly the mothers about the following:
   - Causes of acute respiratory illness
   - Risk factors of ARI
   - Dangerous signs of ARI illness and the importance of simple supportive therapy as well as the early referral of child with severe illness.
   - The value of timely and complete immunization and the importance of breast-feeding.

3. Strengthening of IMNCI in order to make its message reach the majority of mothers through the following:
   - Mass media
   - Training of doctors and medical workers

   - To have an ARI unit PHC centre, especially in low standard of living areas high density population and low level of education.

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How to cite this article: Kiranmai B, Asma, Prashamsa et al. A cross-sectional study on prevalence and risk factors associated with acute respiratory infections in children below 5 years attending the paediatric OP of Gandhi hospital, Musheerabad, Telangana. Int J Health Sci Res. 2016; 6(12):15-20.

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