Original Article

ESTIMATED PROPORTION AND FACTORS ASSOCIATED WITH ACUTE RESPIRATORY INFECTIONS IN CHILDREN UNDER FIVE IN ISLAMABAD PAKISTAN

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Abstract

Background: Acute Respiratory Infection (ARI) is an important cause of mortality and morbidity in children, especially in under-fives, it is necessary to explore its risk factors for better health of children.**Methods:** This study was a cross sectional study, conducted in the Federal Government Polyclinic Dispensary of G-7/3-4, Islamabad on 104 under five children, from April 2016 to June 2016. All the children from 0-59 years of age, irrespective of sex visiting dispensary were included in the study. Structured questionnaire used to collect the data. Frequencies and proportions were calculated as descriptive part of the analysis while Qui/Fisher Exact test was done as inferential analysis by using SPSS.**Results:** Out of 104 under five children ARI was found in 34 (32.7%). It was more in male children 23 (37.1) compared to female 11 (26.2%). A significant association was found between ARI and child's birthplace, their history of low birth weight, breast-feeding history, vaccination status, mothers education, mother's occupation, number of family members, smoking in fathers, ventilation condition of home, kitchen type, and knowledge of mothers regarding ARI signs and symptoms.**Conclusion:** The present study found that ARI is prevalent in under five children of the studied area. Results suggested that there is need to enhance the knowledge of mothers regarding ARI risk factors, its signs and symptoms, prevention and treatment.**Keywords:** Acute Respiratory Infections, children under five, risk factors, knowledge, Pakistan.

Introduction

AR infection is among one of the major public health problem. It is a leading cause of mortality and morbidity not only in developing countries but also in developed countries. Globally, about thirteen million children less than five years of age die every year, 95% of these deaths occur in developing countries, while one third of these total deaths are due to AR infections. In the developing countries, seven deaths out of ten, in children under five years of age group are due to acute respiratory tract infections. The Disability Adjusted Life Years (DALYs) lost due to AR infections in South East Asia Region are very high, about 3,30,26,000.(1) Major cases were happen in India as forty three million, China as twenty one million, Pakistan as ten million, and each Bangladesh, Nigeria, and Indonesia were six million episodes.(2)

According to WHO and UNICEF over 4 million (30%) of the 14 million under five deaths annually are due to ARI, including measles (1.5 million) and whooping cough (0.5 million). Pneumonia accounts for 70% of ARI deaths, measles and pertussis for 25% and croup or

respiratory syncytial virus (RSV) disease (presumably bronchiolitis) for 5%. Mostly ARI are limited to the upper portion of the respiratory tract and only five percent involve the lower respiratory tract. (3)

Child deaths due to Pneumonia decreased as 47% annually from 1.7 million that reported in 2000 to 922,000 in 2015. It estimated that almost 2500 child deaths occur per day due to Pneumonia. Around four-fifths of all child deaths occur in twenty-six countries and half of all these deaths occur in five countries. These countries are as China (4%), Congo (6%), Pakistan (6%), Nigeria (13%) and India (22%). According to the Pneumonia Fact Sheet of 2014, in Pakistan about seventy one thousand children die due to pneumonia every year. In rural area of Pakistan, child mortality is high whereas the incidence of ARI is around 30-35. (4)

In Pakistan, less than five years of age make about 14% of the total population. In the past five years infant mortality rate (IMR) and under 5 mortality rates are 74 deaths/ 1,000 live births, and 89 deaths/ 1,000 live births. At these levels, one in every fourteen children dies before reaching the age of one year, and one in every

eleven die before their fifth birthday. It noticed that number of neonatal deaths remained unchanged for the previous twenty years, whereas IM reduced by nineteen percent and mortality under five years of age has decreased by twenty-four percent over the same period. It is relatively higher in Punjab and Balochistan than in the other provinces of Pakistan. Childhood mortality in general and infant mortality in particular used as major indicators of socioeconomic development and health status of the country. (5)

Previous studies identified various risk factors that are associated with Air respiratory infections, like mother and child malnutrition, low birth weight baby, prelacteal feeding, breast-feeding practices, immunization status of children, overcrowding at homes, inadequate ventilation system, indoor smoke etc. (6). In rural areas, unavailability or shortage of health care services, deficient knowledge or lack of awareness, in combination with other factors like poverty, environmental factors, indoor air pollution, absence of ventilation, overcrowding, overuse and misuse of antibiotics, and defects in immune system are responsible factors. (7)

With this background, the present study conducted to determine the current pattern prevalence and potential risk factors of ARI in children under five years of age receiving health facility from the Federal Government Polyclinic Dispensary in G-7/3-4, Islamabad.

Methodology

This was a cross sectional study carried out in duration of three months from April 2016 to June 2016 on under five children receiving health care from the Federal Government Polyclinic Dispensary of G-7/3-4 Islamabad. All the children from 0-59 years of age, irrespective of sex visiting dispensary were included in the study. Children who had ARI with other diseases like diarrhea, worm infestation, mental illness, and debilitating disease excluded from the study. The study variable was the absence or presence of ARI among children less than 5 years of age. Independent variables of interest were possible potential risk factors for ARI complications such as mothers'/ caregiver's knowledge of management of ARI in children, their educational level; partial/no immunization status of children, socioeconomic status, indoor air pollution, ventilation system, smoking among parents etc. A Predesigned, pretested questionnaire used for data collection. During data collection, there was no refusal as the objectives of the study clearly explained and questions asked by trained staff and within ethical consideration. Data from the questionnaires entered into a Microsoft Excel database and cleaned before analysis. Analysis done by using 'Statistical Package for Social Scientists' (SPSS) software. Categorical variables were analysed by calculating frequencies and proportions. As statistical tests of comparison chi square test/ Fisher's Exact Test used with P-value less than 0.05 as the limited level of

significance. Data presented in tables and figures. The Ethical Committee of Health Services Academy, Islamabad, provided the ethical clearance and permission for research. The study conducted after approval from the dispensary authority and consent of the respondents. Data used solely for the purpose of the study.

Results

A cross sectional study was conducted to estimate the proportion of Air Respiratory Infections (ARI) and some of the factors responsible for it among children under five years of age in G-7/3-4, Islamabad.

Proportion of ARI

Out of 104 children, infection found in 34 (32.7%).

Factors associated with ARI

Children characteristics associated with ARI

Among 104 participated children 62(59.6%) were the male while 42(40.4%) were female children. Proportion of ARI in male children found as 23(37.1%) which was high as compared to female children 11(26.2%). Out of total 87(83.7%) of the children were delivered at health care facility. Proportion of ARI was seems more in those whose place of birth was home (62.5%) compared to those who took birth at health care facility (33.3%). In participated children 14(13.5%) were low birth weight babies in whom 71.4% had infection. Two children reported as they had some illness at the time of birth, who also suffered in air respiratory infections at the time of study. Rate of Exclusive Breast Feeding was found in 85 (81.7%) children. 28.2% children with breast feeding history had infection while 100% and 43.8 with bottle and mixed feeding were infected. Out of total 84(85.8%) children participated in this study were fully immunized, while 20(19.2%) were partially or not immunized. ARI was prevalent in immunized children as 25% and in partially immunized children as 65%. Prevalence of ARI found statistically significant with child place of birth, history of low birth weight, and history of feeding and vaccination status of the children with p-values less than 0.05. (Table 1)

Table 1: Children characteristics associated with ARI

Study variable	Total n(%)	With ARI n(%)	Without ARI n(%)	*P-Value
Children birth place				
Home	8 (7.7)	5(4.8)	3(2.9)	0.017
Health care facility	87 (83.7)	29(27.9)	58(55.8)	
Private hospital	9 (8.7)	0	9(8.7)	
Children H/O LBW				
Yes	14 (13.5)	10(9.6)	4(3.8)	0.002
No	90 (86.5)	24(23.1)	66(63.5)	
BF history of children				
Mother feed only	85 (81.7)	24(23.1)	61(58.7)	0.016
Bottle feed only	3 (2.9)	3(2.9)	0	
Mixed (Both)	16 (15.4)	7(6.7)	9(8.7)	
Vaccination coverage status of children				
Fully immunized	84(80.8)	21(20.2)	63(60.6)	0.001
Not fully immunized	20(19.2)	13(12.5)	7(6.7)	

* $p = \chi^2 / \text{Fisher Exact test}$

Parental/ residential characteristics associated with ARI

More mothers 48(46.2%) lie in age group 25 to 29 years, followed by 30 to 34 years group as 37(35.6%). 12(11.5%) mothers were less than 25 years while 7(6.7%) of the participated mothers were above 34 years of age. Out of total 21(20.2%) mothers were found as illiterate, 34(32.7%), 31(29.8%), 14(13.5%) and four (3.8%) had primary, secondary, bachelors and masters/higher level of education respectively. Among children fathers 4(3.8%) were found as illiterate, 18(17.3%), 29(27.9%), 41(39.4%) and 12(11.5%) had primary, secondary, bachelors and masters/higher level of education respectively. 91 (87.5%) of the mothers were housewives. Few respondent children found as having parents with history of asthma, allergy, and TB/any other chronic respiratory disease history. No child had mother with smoking history. Fathers of 62(59.6%) children were smokers. Out of which 28(45.2%) had ARIs. ARIs found statically significant with mothers education, mothers occupation, number of family members, and with fathers smoking with p-value less than 0.05.

Among all participants monthly income of 20(19.2%) households was less than 15,000/- per month. 15(14.4%) earn more than 25,000/- per months. While the monthly income of others ranges between 15,001/- to 25,000/- per month in Pakistani currency rates. Few 15(14.4%) had personal house. Kitchen of half 52(50%) houses were open. Ventilation system of 42(40.4%) houses found as adequate. ARIs found to be significantly associated with kitchen type and ventilation system of houses with p-values <0.05. (Table 2)

Table 2: Parental characteristics associated with ARI

Variable of study	Total n(%)	With ARI N(%)	Without ARI N(%)	P-Value
Mothers education				
Illiterate	21(20.2)	9(8.7)	12(11.5)	0.001
Primary	34(32.7)	18(17.3)	16(15.4)	
Secondary	31(29.8)	7(6.7)	24(23.1)	
Bachelors	14(13.5)	0	14(13.5)	
Masters and above	4(3.8)	0	4(3.8)	
Mothers occupation				
House wife	91 (87.5)	34(32.7)	57(54.8)	0.027
Private job	6 (5.8)	0	6(5.8)	
Govt job	7 (6.7)	0	7(6.7)	
Family members				
-	20 (19.2)	1(1)	19(18.3)	0.007
5-6	46 (44.2)	20(19.2)	26(25.0)	
-	38 (36.5)	13(12.5)	25(24)	
Smoking in fathers				
Yes	62(59.6)	28(26.9)	34(32.7)	0.001
No	42(40.4)	6(5.8)	36(34.6)	
Ventilation				
Adequate	42 (40.4)	22(21.2)	20(19.2)	0.001
Inadequate	62 (59.6)	12(11.5)	50(48.1)	
Kitchen type				
Open	52(50)	12(11.5)	40(38.5)	0.05
Closed	52(50)	22(21.2)	30 (28.8)	

* $p=x^2/\text{Fisher Exact test}$

Knowledge of mothers regarding ARI signs and its treatment preferences

Majority 80(76.9%) of mothers/fathers who gave interview were unaware about the signs and symptoms of ARIs. Most of them gave preference to government health facility for getting treatment. ARI was found statistically significant with the knowledge of mothers regarding ARI signs and symptoms with p-value <0.001. (Table 3)

Table 3: Association of ARI with mother's knowledge and its treatment preferences

Variable of study	Total n(%)	With ARI N(%)	Without ARI N(%)	P-Value
Knowledge of mothers regarding ARI signs and symptoms				
Fast/Difficult breathing	5(4.8)	0	5(4.8)	<0.001
Pain in chest	8(7.7)	3(2.9)	5(4.8)	
Fever	10(9.6)	9(8.7)	1(1)	
Sputum	1(1)	1(1)	0	
Don't know	80(76.9)	21(20.2)	59(56.7)	

* $p=x^2/\text{Fisher Exact test}$

Discussion

Estimated proportion of ARI among children

The main objectives of this study were to find out the estimated proportion of ARI and its associated factors among children under five years of age in Islamabad. The overall estimated prevalence of ARI found as 32.7%. This percentage is high compared to studies done in Gujrat-India, Raichur and Moradabad, as 22%, 16.6% and 27.69%. (1, 9, 10) However, the prevalence of ARI among children of Meerut is much high compared to this study that was 52%. (11) This difference may be due to inherent difference of population, seasonal variations, sampling method and survey design.

Factors associated with ARI

In my study the prevalence of ARI was slightly higher among males than females in tune with other studies done in Lucknow and India.(10, 12) In this study proportion of ARI was found more in children with age ranged in 2 to 11 months as 46.7% although it was not statistically significant. While in Australian study age was presented as an independent risk factor for ARI.(8) According to the Indian study cchildren old between three to five years less likely suffered from AR infections than children from other age groups.(12) Another study indicated that children aged between 12 to 47 months were at high risk of getting ARI.(10)

The percentage of air respiratory infections was found significantly high in children having low birth weight, and in those who not breastfed exclusively in tune with the study conducted in Moradabad.(10) In another study significant association was found between air tract infections and low birth weight babies, prelacteal feeding, timely initiation of breast feeding to child, complementary feeding and immunization status of the child.(1)

In my study ARIs found statically significant with mothers education, mothers occupation and number of family members, kitchen type and ventilation system of houses. According to other study higher prevalence of ARI was seen in children with inadequate living condition (31%), low socio-economic status (88%), and in those who had illiterate mothers (64%).(9) Another study found significant association between AR infections and nutritional status of the child, immunization status, weaning practices, and mothers' literacy status. However, the literacy status of fathers did not show any association with AR infections of their kids like this study. (13)

Another study indicated that low socio economic class, poor nutritional status, prelacteal feeding, delay in breast feeding initiation, and immunization status of children as significant risk factors for Acute Respiratory Infections in under-five children.(12) No significant association was found between parental medical history and ARI prevalence among children in this study. These results contrast with research of Zambia, it explored mothers with history of ARI and siblings with a history of ARI as ARI factors. (14) According to another study, it was higher in children who had illiterate mother, children with lower socioeconomic status, those who lived in overcrowded conditions inadequate ventilation, and use of smoky challah, malnutrition and parental smoking were also identified as risk factors of ARI. (11)

In my study ARIs found statistically significant with fathers smoking, other family member smoking and smoking frequency at home. Another study also explored smoking among parents as a potential risk factor of ARI.(10) A significant association was found between AR infections and nutritional status, prematurity, low birth weight, prelacteal feeding, lack of breastfeeding, delayed weaning, immunization status, living in overcrowded conditions, and mothers' literacy status. Improper housing condition, inadequate ventilation, exposure to indoor air pollution in form of combustion from cooking fuel were found as significant risk factors for infections in under-five children.(15)

In my study no association of ARI was seen with child gender, child age, mother age, father education, fathers occupation, medical history of parents, monthly household income, house type and treatment preferences of the participants. A study done in Ogan Ilir concluded that nutritional status, exclusive breastfeeding, bedroom density, ventilation condition in the morning/afternoon, the type of roof, the type of cooking fuel, smoking habit in the house, and immunization status had not statistically associated with acute respiratory infection (ARI) incidence on children under five years old.(16)

Conclusion

Out of 104 children, AR infection found in 34 (32.7%). There is need to enhance the knowledge of mothers regarding ARI risk factors, its signs and symptoms, prevention and treatment.

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