



ORIGINAL ARTICLE

Types and outcome of Respiratory Diseases among children at a tertiary healthcare facility.

Asif Ali Khuhro¹, Khurram Shahnawaz², Farhan Zahoor³, Mehtab Hussain⁴, Sadaf Liaqat⁵, Sohaib Riaz⁶, Fazal ur Rehman⁷

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ABSTRACT... Objective: To find out the types and outcome of respiratory illnesses at a tertiary healthcare facility. **Study Design:** Cross-sectional study. **Setting:** Department of Pediatrics, Rai Medical College Teaching Hospital, Sargodha Pakistan. **Period:** January 2022 to July 2022. **Material & Methods:** Admitted children of both genders aged between 1 month to 12 years were analyzed. At the time of admission, characteristics like gender, age, body weight, vaccination status and types of respiratory illness were noted. Duration of hospitalization along with outcome was recorded. **Results:** During the study period, a total 851 children were admitted. Out of these 851 children, 266 (31.3%) children had some kinds of respiratory illnesses and were further analyzed. There were 148 (55.6%) male children while overall mean age was 3.9 ± 2.6 years. Pneumonia was the commonest respiratory illness noted in 92 (34.5%) children while bronchiolitis was the 2nd most common respiratory illness observed in 56 (21.1%). A total of 241 (90.6%) children were discharged, 11 (4.1%) referred to other departments, 7 (2.6%) LAMA while deaths were noted in 7 (2.6%). Vaccination status was found to have significant association with the outcome ($n=0.0096$). **Conclusion:** Respiratory illnesses contribute significantly to children admitted to resource limited healthcare facilities. Poor immunization status has significant association with mortality among children with respiratory illnesses.

Key words: Bronchiolitis, Mortality, Pneumonia, Respiratory Illnesses, Vaccination.

INTRODUCTION

Respiratory illnesses are considered to be an important reason of morbidity and mortality in pediatric age groups while the impact of respiratory illnesses is more pronounced among children aged below 5 years.^{1,2} Variation exists in patterns of respiratory diseases ranging from upper to lower as well as communicable to non-communicable types while environmental and climate factors are known to influence the patterns of morbidity and mortality of these diseases. Data from developed countries revealed respiratory illnesses to be the cause of 13-25% hospital admission among children.^{4,5} Local data lacks about the exact burden of respiratory illnesses in children but data from developing world showed respiratory illnesses to be the cause of 24.7% pediatric admission.⁶

Lots of research has been done about a specific respiratory illness and its causes and impact on the morbidity as well as mortality among children but not many studies have been done to identify patterns of respiratory illnesses especially in Pakistan. The findings of this study were thought to help stakeholders/government to plan much needed interventions and resource manipulation aiming minimization of respiratory illnesses in resource limited areas of the country. Similarly, our findings can help in development of local and national framework for the reduction of modifiable risk factors contributing to respiratory illnesses. The aim of the present study was to find out the types and outcome of respiratory illnesses at a tertiary healthcare facility.

MATERIAL & METHODS

This cross-sectional study was conducted

1. FCPS (Pediatric Medicine), Associate Professor Pediatrics, Pir Abdul Qadir Shah Jilani Institute of Medical Science Gambat, District Khairpur.

2. FCPS (Pediatric Medicine), Associate Professor Pediatrics, Sahara Medical College, Narowal.

3. FCPS (Pediatric Medicine), Assistant Professor Pediatrics, Fatima Jinnah Medical University/Sir Gangaram Hospital, Lahore.

4. FCPS (Pediatric Medicine), Assistant Professor Pediatrics, Jinnah Medical and Dental College, Karachi.

5. FCPS (Pediatric Medicine), Associate Professor Pediatrics, Rai Medical College, Sargodha.

6. FRCPC, Assistant Professor Pediatrics, University Medical and Dental College, Faisalabad.

7. FCPS (Pediatric Medicine), Fellow Pediatric Cardiology Pediatric Cardiology, NICVD, Karachi.

Correspondence Address:

Dr. Fazal ur Rehman
Department of Pediatric Cardiology,
NICVD, Karachi.
fazal171@gmail.com

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at the department of Pediatrics, Rai Medical College Teaching Hospital, Sargodha Pakistan from January 2022 to July 2022. Approval from Hospital's Ethical Committee was acquired (Letter no. ERC/2020/095, dated: 10th February, 2021). Written consents were acquired from parents/guardians of all study participants. Admitted children of both genders aged between 1 month to 12 years were included. All children were treated as per standard treatment protocols. At the time of admission, characteristics like gender, age, body weight, vaccination status and types of respiratory illness were noted. Duration of hospitalization along with outcome (discharged, death, referred or leave against medical advice) was recorded in all patients. A special proforma was designed to record all study data.

"Statistical Package for Social Sciences (SPSS)", version 26.0 was utilized for data analysis. Qualitative data was represented as frequency and percentage while mean and standard deviation (SD) were calculated for quantitative variables. Chi-square test was applied to compare outcome with respect to characteristics of the children studied. P-value < 0.05 was considered significant.

RESULTS

In a total of 266 children with respiratory illnesses,

148 (55.6%) were male and 118 (44.4%) female representing a male to female ratio of 1.3:1. Mean age was noted to be 3.9 ± 2.6 years while 105 (39.5%) children were aged between 1 month to 1 year, 82 (30.8%) above 1 year up to 5 years, 54 (20.3%) above 5 years up to 10 years whereas remaining 25 (9.4%) were aged above 10 years. Overall, mean body weight was noted to be 8.8 ± 6.4 kg. There were 112 (42.1%) children who were fully vaccinated 67 (25.2%) partially vaccinated while remaining 87 (32.7%) were unvaccinated. Pneumonia was the commonest respiratory illness noted in 92 (34.5%) children while bronchiolitis was the 2nd most common respiratory illness observed in 56 (21.1%). Table-I is showing gender wise and age wise distribution of the types of respiratory illnesses.

A total of 241 (90.6%) children were discharged, 11 (4.1%) referred to other departments, 7 (2.6%) LAMA while deaths were noted in 7 (2.6%). Five (71.4%) out of 7 children died due to pneumonia. Mean duration of hospitalization was 2.5 ± 1.5 days whereas duration of hospitalization was less than 3 days in 163 (61.3%) children. Table-II is showing distribution of outcome with regards to gender, age, vaccination status and duration of hospitalization. Vaccination status was found to have significant association with the outcome ($n=0.0096$).

Respiratory Illness	Total (%)	Gender		Age Groups (years)			
		Male	Female	<1	> 1 to 5	> 5 to 10	> 10
Pneumonia	92 (34.5%)	57	35	37	28	20	7
Bronchiolitis	56 (21.1%)	32	24	26	18	10	2
Wheezy Bronchitis	24 (9.0%)	10	14	11	6	5	2
Pharyngitis	21 (7.9%)	11	10	10	5	3	3
Tonsillitis	17 (6.4%)	8	9	7	6	2	2
Asthma	15 (5.6%)	8	7	3	7	4	1
Otitis Media	8 (3.0%)	4	4	2	3	2	1
Pulmonary Tuberculosis	8 (3.0%)	3	5	2	2	3	1
Croup	5 (1.9%)	3	2	1	2	1	1
Foreign Body	5 (1.9%)	3	2	1	2	1	1
Pneumothorax	5 (1.9%)	3	2	2	1	1	1
Others	10 (3.8%)	6	4	3	2	2	3
Total	266(100%)	148	118	105	82	54	25

Table-I. Distribution of respiratory illnesses with respect to gender and age groups

Characteristics		Discharged	Referred	LAMA	Death	P-Value
Gender	Male(n=148)	135	6	4	3	0.9213
	Female(n=118)	106	5	3	4	
Age Groups (years)	<1(n=105)	96	4	2	3	0.8541
	>1 to 5(n=82)	75	3	2	2	
	>5 to 10(n=54)	50	2	1	1	
	>10(n=25)	20	2	2	1	
Vaccination Status	Fully Vaccinated(n=112)	105	4	2	1	0.0096
	Partially Vaccinated(=67)	60	3	2	2	
	Unvaccinated(=87)	76	4	3	4	
Duration of Hospitalization	<3 days (n=163)	149	9	2	3	0.1048
	>3 days (n=103)	92	2	5	4	

Table-II. Distribution of outcome with respect to gender, age groups, vaccination status and duration of hospitalization (N=241)

DISCUSSION

Respiratory illnesses are considered to be major cause of morbidity and mortality. Oguonu T et al. from Nigeria reported 24.7% of pediatric admissions at a teaching hospital due to respiratory diseases.⁶ Local study from Abbottabad by Bibi S et al. reported that 26.7% of the admitted children had respiratory ailments.⁷ Local data from periurban areas of Karachi reported prevalence of acute respiratory infections among children between 2 months to 5 years as 44.0%.⁸ All these studies indicate that burden of respiratory illnesses vary not only among different parts of the world but in different regions of the same country as well.

We noted that 55.6% of the children with respiratory illnesses were male. Liu Y and colleagues noted 2/3rd of the children with respiratory diseases to be male.⁹ Another study from Thailand revealed 77.1% of the children with severe community acquired pneumonia to be male.¹⁰ A study from Mali found 57.1% of the children with pneumonia to be male.¹¹ Data from Nigeria also reported male dominance among children with respiratory illnesses ranging between 58-62%.^{6,12} Hoo AF et al. credited relatively smaller airways size in male children in comparison to girls could be the reason behind this male predominance among children with respiratory illnesses.¹³ Cultural norms prioritizing male children for healthcare seeking behavior could be another reasons for this male predominance. We noted that 70.3% of the children were aged \leq 5 years. Similar findings have been documented by researchers from

China⁹ and Nigeria.⁶

Respiratory illnesses put significant burden on the healthcare systems all over the world and may lead to major complications putting economic and psychological distress on the families of the affected children. Acute respiratory infections especially pneumonia is considered to be the most frequent cause of pediatric morbidity and mortality globally. The "World Health Organization" and "United Nations Internal Children's Emergency Fund" estimated acute respiratory infections to be the cause of death in more than 2 million children worldwide while these deaths form 1/5th of all deaths reported among children below 5 years of age.^{14,15} Lots of efforts have been made to reduce morbidity and mortality related to respiratory tract infections but still, lot more is desired aiming significant reduction in morbidity and mortality with respiratory ailments all over the world. Data from Pakistan estimated around 250,000 children dying annually due to pneumonia while Pakistan stands in the top 5 countries with the highest death rates in children due to pneumonia.¹⁶ It is also estimated that more than 80% of the deaths attributed to respiratory illnesses are due to inadequate and late healthcare seeking behaviors.¹⁷

We noted that pneumonia, bronchiolitis and wheezy bronchitis were the commonest respiratory illness noted in 34.5%, 21.1% and 9.0% children respectively. Local data from Karachi revealed bronchopneumonia to be the most common disease (62.9%) requiring admission among

children.¹⁸ A study by Oguonu T et al revealed 29.1% children to have pneumonia which is very close to what we noted.⁶ In a study from Nigeria, Ibraheem RM et al. noted pneumonia to be the cause of admission in almost half of the children.¹⁹ A study from Abbottabad reported bronchiolitis to be the 2nd most common respiratory disease noted in 29.1% children while we also noted 21.1% of the children to have bronchiolitis.⁷

In the present research mortality was noted in 2.6% children admitted with respiratory illnesses while local and international data shows comparable findings ranging mortality rates among children with respiratory diseases to between 1.3-7.5%.^{7,11,19,20} In the present study, immunization status was found to have significant association with the outcome as 71.4% of the children who died were either unvaccinated (42.9%) or partially vaccinated (28.5%). Low rates of literacy and economic status could be potential reasons behind low rates of vaccination in rural areas of Pakistan as has been reported by other researchers. Policies should be made to improve literacy rates and early health seeking behaviors in the general population. Provision of essential medications and oxygen supply at healthcare settings like ours should be prioritized while efforts should be put to optimize immunization coverage and pediatric health awareness.

Our study had some limitations as well. We were unable to record findings of the viral PCR, nasopharyngeal swabbing, tracheal aspirates or blood cultures for the identification of the etiological agents involved. As this was a single center study, our findings cannot be generalized.

CONCLUSION

Respiratory illnesses contribute significantly to children admitted at a tertiary healthcare facility. Poor immunization status has significant association with mortality among children with respiratory illnesses.







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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Asif Ali Khuhro	Introduction, Proof reading.	
2	Khurram Shahnawaz	Critical revisions, Data analysis.	
3	Farhan Zahoor	Proof reading, Data interpretation.	
4	Mehtab Hussain	Literature review, Methodology.	
5	Sadaf Liaqat	Data collectin, Final approval.	
6	Sohaib Riaz	Literature review, References.	
7	Fazal ur Rehman	Drafting.	