

Childhood Pneumonia at Omdurman Paediatric Hospital, Khartoum, Sudan

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Abstract

An epidemiological study was carried out in Omdurman Paediatric Hospital, Khartoum, Sudan about childhood pneumonia. The study aimed at measuring the proportion of pneumonia among attendant children and to highlight the disease-related factors. A questionnaire was used to collect required data from 282 of children. The answers were given by their mothers. The proportion of pneumonia in children was 20.2%. The disease was more frequent in males rather than females with Odds Ratio (OR) = 2.4123 - 95% and Confidence Interval (CI) = from 1.3361 to 4.3555. There was statistical association between pneumonia and age of child ($X^2 = 55.169 - P \text{ value} = 0.000$), family income ($X^2 = 26.862 - P \text{ value} = 0.00000147$), family residence (Relative Risk (RR) = 2.657, 95% Confidence Interval (CI) = from 1.9391 to 3.6402) and mother's education ($X^2 = 56.58, P \text{ value} = 0.000$). The study concluded that childhood pneumonia still common among children less than five years of age.

Keywords: childhood, pneumonia, paediatric, hospital, Sudan

Introduction

Pneumonia is an acute inflammation of the respiratory bronchioles, alveolar ducts, alveolar sacs, and alveoli of the lung. The inflammation may be either unilateral or bilateral and involve all or a portion of the affected lung (Carol and Marcia, 2011).

Pneumonia is a serious infancy and childhood disease. The children under 5 years of age with protein energy malnutrition or immunodeficiency have the highest risk for developing morbidity and mortality from severe pneumonia (Karim Eldin *et al*, 2011). It is one of the most important causes of childhood morbidity and mortality, especially in developing regions (Ana *et al*, 2004). Pneumonia is responsible for about 19% of all deaths in children aged less than 5 years, of which more than 70% take place in sub-Saharan Africa and south-east Asia (Igor *et al*, 2008). However, most cases get better with antibiotics by mouth at home.

Poling *et al* (2014) found in Northwestern Ontario That the annual incidence of hospital admissions related to community-acquired pneumonia was 3.42 per 1000 population

Streptococcus pneumoniae and *Haemophilus Influenzae* remain the most important pathogens documented in previous studies (Abdulkarim *et al*, 2013). Pneumonia causes about two million under five deaths each year, accounting for nearly one in five child deaths globally (Gedefaw *et al*, 2014). In developed countries, mortality from childhood Community-acquired

pneumonia (CAP) has decreased in the last few decades, but this disease continues to be a common cause of morbidity and hospitalization (Gustavo *et al*, 2009).

Materials and Methods

The study was carried out at Omdurman Paediatric Hospital, Khartoum, Sudan. It is a big hospital and served a large catchment area. The study population was children under five years old who were attending hospitals during the period of study.

A questionnaire was used to collect required data from 282 of children. The answers were given by their mothers. The collected data were analyzed using Statistical Package for Social Sciences (SPSS). Chi square (X^2), Odds Ratio (OR) and Relative Risk (RR) were calculated to determine statistical association between different variables.

Results

The results show that 57(20.2%) out of 282 were infected with childhood pneumonia (table 1). In table 2 the proportion of pneumonia among males was 29.1% while among females was 14.5% (Odds Ratio (OR) = 2.4123 - 95% Confidence Interval (CI) = from 1.3361 to 4.3555). Table 3 shows age distribution of childhood pneumonia, the highest percentage (65.7%) was among age group from 6 to 18 months while the lowest (2.9%) one was in age group 33-48 months ($X^2 = 55.169 - P \text{ value} = 0.000$).

The childhood pneumonia was more frequent among children with low family income 35(36.1%) ($X^2 = 26.862$ - P value = 0.00000147) as shown in table 4. Table 5 shows the relationship between the disease and place of residence (Relative Risk (RR) = 2.657, 95% Confidence Interval (CI) = from 1.9391 to 3.6402). Educational level and its relation with pneumonia was displayed in table 6, that 52.9% of illiterate mothers have infected children

Table 1 The proportion of childhood Pneumonia infection at Omdurman Paediatric Hospital, Khartoum, Sudan

Pneumonia	No	%
Infected	57	20.2%
Non-infected	225	79.8%
Total	282	100

Table 2 Sex distribution of childhood Pneumonia infection at Omdurman Paediatric Hospital, Khartoum, Sudan

Sex	Pneumonia infection				Total	
	Infected		Non-infected			
	No	%	No	%	No	%
Male	32	29.1%	78	70.9%	110	39%
Female	25	14.5%	147	85.5%	172	61%
Total	57	20.2%	225	79.8%	282	100

Odds Ratio (OR) = 2.4123
95% Confidence Interval (CI) = from 1.3361 to 4.3555

Table 3 Age distribution of childhood Pneumonia infection at Omdurman Paediatric Hospital, Khartoum, Sudan

Age group	Pneumonia infection				Total	
	Infected		Non-infected			
	No	%	No	%	No	%
>6 months	14	17.7	65	82.	79	28
6 – 18 months	23	65.7	12	34.3	35	12.5
19 – 32 months	13	16.	66	83.5	79	28
33 – 48 months	1	2.9	33	97.1	34	12
49 – 60 months	6	10.9	49	89.1	55	19.5
Total	57	20.2	225	79.8	282	100

$X^2 = 55.169$, P value = 0.000

Table 4 Relationship between family income and childhood Pneumonia infection among children under five years at Omdurman Paediatric Hospital, Khartoum, Sudan

Level of family income	Pneumonia infection				Total	
	Infected		Non-infected			
	No	%	No	%	No	%
Low	35	36.1	62	63.9	97	34.4
Moderate	17	10	153	90	170	60.3
High	4	26.7	11	73.3	15	5.3
Total	57	20.2	225	79.8	282	100

$X^2 = 26.862$, P value = 0.00000147

Table 5 Relationship between family place of residence and childhood Pneumonia infection among children under five years at Omdurman Paediatric Hospital, Khartoum, Sudan

Place of residence	Pneumonia infection				Total	
	Infected		Non-infected			
	No	%	No	%	No	%
Rural	35	11.3%	173	88.7%	195	69.1%
Urban	22	40.2%	52	59.8%	87	30.9%
Total	57	20.2%	225	79.8%	282	100

Relative Risk (RR) = 2.657
95% Confidence Interval (CI) = from 1.9391 to 3.6402

Table 6 Relationship between mother's education and childhood Pneumonia infection among children under five years at Omdurman Paediatric Hospital, Khartoum, Sudan

Educational level	Pneumonia infection				Total	
	Infected		Non-infected			
	No	%	No	%	No	%
Illiterate	27	52.9%	24	47.1%	51	18.1%
Khalwa	10	28.6%	25	17.4%	35	12.4%
Primary	14	23	47	77	61	21.6%
Intermediate	6	4.7%	122	95.3	128	45.4%
Secondary	0	0	5	100	5	1.8%
University	0	0	2	100	2	0.7%
Total	57	20.2%	225	79.8%	282	100

$X^2 = 56.58$, P value = 0.000

Discussion

Pneumonia refers to an infection of the lungs, which can be caused by a variety of microorganisms e.g. bacteria, viruses, fungi, and parasites. The infection is prevalent in children, particularly, children whose immune systems are compromised. Considerable numbers of hospital-attending children are infected with infectious pneumonia. The present study revealed that 20.2% of studied children were infected with pneumonia. In a study conducted in Spain, an incidence of pneumonia in children less than three years was 6.4 cases per 1000 (Gustavo *et al*, 2009). While in a community-based study in Ethiopia, the overall two weeks prevalence of pneumonia among under-five children was 16.1% (Gedefaw *et al*, 2014). According to statistical analysis in this study males were more affected with pneumonia than females (Odds Ratio (OR) = 2.4123 - 95% Confidence Interval (CI) = from 1.3361 to 4.3555). However pneumonia spread more in children. The disease is the most common community-acquired pneumonia at all ages. The present study revealed that highest percentage was among children in age group from 6 to 18. Abdulkarim *et al* (2013) found that the male: female ratio was 1.5:1 and 101(60.5%) of the children were infants.

Economic status has role in the infection as it is more spread in children from families with low income. Collected data about pneumonia in under-five children admitted to emergency units of two teaching hospitals in

Khartoum, Sudan showed that most of the patients were of low socioeconomic class families (Karim Eldin *et al*, 2011). Educated mothers are usually able to care their children, because they knew more information than illiterate mothers.

Conclusion

The proportion of pneumonia in children was 20.2%. The disease was more frequent in males rather than females. Child age, family income, family residence and mother's education were associated with pneumonia.

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