Prevalence of Sever pneumonia in children 2-59 months for one Year in Pediatric Department of Mirwais Regional Hospital, Kandahar, Afghanistan

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Abstract

Respiratory diseases remain a major cause of morbidity and mortality in children especially among children less than five years old. To study the demographic profile and the clinical profile that they presented with, as well as the outcome of the severe pneumonia in children from 2months to 5years who were admitted to pediatric department of Mirwais regional Hospital, Kandahar Afghanistan. This cross-sectional study was conducted in Mirwais Regional hospital pediatric ward Kandahar Afghanistan the data of all the patients of sever pneumonia who were from 2months to 5 years, who were admitted from severe pneumonia in MRH in pediatric ward from 10 November 2018 to 9 November 2019 were collected, compiled and analyzed from the Medical Records of each case at Hospital. Information obtained from the patient mother was coded and entered into computer software. After that, the data were analyzed with SPSS version 22. 0. Multivariate Logistic Regression Model was used for finding factors association with pneumonia mortality. Out of the 462 cases of severe pneumonia, 256 (55.4%) were males and 206 (44.6%) were females. Their ages varied from 2months to 5 years the median age was five months (range 2-59 months). The overall mortality rate was 57(12.75) % and of 390 (87.24.82%) patients were cured. Regarding to residency 202(43.7%) urban and, 260(62. 3%) were rural resident. More number of cases were admitted during the winter and fall season. 380 (82.1%) patients were in the age group of 2- 12 month. Out of 462 patient the patients 199 (43%) had malnutrition out of malnutrition children 132(28.57%) had severe malnutrition P-value (0.0001 OR=4.73). About 103 (22.2%) patients were completely immunized according to their age, 51(11%) didn't take any vaccination and the remaining 308(66.5) were partially vaccinated. 167 (36.1%) patients were exclusively breastfed. The prevalence and case fatality of severe pneumonia was higher in infancy. Although boys were at high risk of sever pneumonia than girls, our analyses show that there is an underlying burden of sever pneumonia between 2 – 59 months. Rainy and winter, dry and dusty fall season were associated with higher prevalence of disease.

Keywords: Severe pneumonia, children, Kandahar, mortality

Introduction

Global Burden of Disease study estimates suggest that, for children, bacterial pneumonia is the leading single cause of death, responsible for 23 % of deaths in children aged between 27 days and 5 years of age (1) Approximately, 150 million episodes of childhood pneumonia are

reported every year from the world, out of which 95% are from developing countries. (2) Pneumonia accounts for 18% of annual deaths in under five-year-old children worldwide, 20% in developing countries compared to only 4.3% in developed countries (3) 0·9 million children died of pneumonia in 2013, and more than 95% of these deaths happened in low-income and middle income countries(4) Previously, CAP was categorized into three groups by WHO namely pneumonia, severe pneumonia, and very severe disease. Fast breathing alone was categorized as pneumonia, fast breathing with chest in-drawing as severe pneumonia, and fast breathing with chest indrawing along with any of the danger signs, namely inability to feed, drowsiness or altered consciousness, convulsion, cyanosis, as very severe disease. Recently, however, WHO [2014] categorized CAP in children under 5 years of age into two group: pneumonia and severe pneumonia. Fast breathing with or without chest in-drawing is now categorized as pneumonia and fast breathing with any of the danger signs as severe pneumonia.

Methods

This was a one-year hospital based, prospective, record-based study which was done on 2month to 5years children patients who had severe pneumonia in pediatric department Mirwais regional Hospital, Kandahar (Afghanistan), from 10 November 2018 to 9 November 2019. The study was included children irrespective of gender and race with a clinical diagnosis of severe pneumonia. The diagnosis of sever pneumonia was entirely clinical and based on the WHO 2014 criteria for sever pneumonia. This is a referral hospital for children, which is run by the Government. And ICRC the hospital serves to the people of Kandahar and the neighboring province as well referred from different provinces of Afghanistan. The consultation, the ward charges and the drugs are provided free of cost. The hospital has 600 beds which include different department. A consent was obtained from the hospital chairman and ethical committee and also verbally from child mother or closed relative and the data were collected and were entering to previous prepared questioner to the start of the study.

Study Subjects the study included all the children from 2monthst to 5 years, who were clinically diagnosed to be suffering from severe pneumonia. Details of demographic data, socio-economic status, lab exams, breast feeding, nutritional status and complications were obtained from the medical records and they were entered in a questionnaire before their analysis.

Statistical analysis: The statistical analysis was performed by using the SPSS version 22.0 the percentages were calculated for the various parameters which were under study. Multivariate Logistic Regression Model was used for finding factors association with pneumonia mortality.

Inclusion criteria: involved patients between two-months to five-year of age having features of severe pneumonia. The diagnosis of severe and very severe pneumonia was based on WHO criteria (5) **Exclusion criteria:** Children below two-months of age and more than five-years, with CHD, asthma, thalassemia and other syndrome anomalies presenting as pneumonia, were excluded.

Results

The demographic Profile a total of 462 children were treated during the study period of from 10 November2018 to 9 November 2019. 256 (55.4%) were males and 206 (44.6%) were females. Their ages varied from 2months to 59 months with mean aged (9.22±7.75SD).

[Table/Fig-1] shows the demographic profile of the studied population. The median age was five months (range 2-59 months). Most of the patients were male 256 (55.4%). More number of cases were admitted during the first quarter (months of January, February and March) and also quarter 4 (October, November and December). 380 (82.1%) patients were in the age group of 2- 12 month. Out of 462 patient the patients 199 (43%) included in the study had malnutrition out of malnutrition children 132(28.57%) had severe malnutrition P-value (0.0001 OR=4.73). About 103 (22.2%) patients were completely immunized according to their age, 51(11%) didn't take any vaccination and the remaining 308(66.5) were partially vaccinated. 167 (36.1%) patients were exclusively breastfed. Factors associated with mortality of children presented with severe pneumonia are tested through running multivariate logistic regression model for 447 observations after excluding 15 who left the hospital before observing the outcome (cure or death). 390 children (84%) have cured and successfully discharged from MRH, 57 children (12.75%) have died while 15 children (3%) have left the hospital against medical advice. Male to female ratio (61.4:38.59%). 177 (38.3%) children had history of exposure to smoke. [Table/Fig-2] shows factors associated with pneumonia mortality clinical feature which were differently statistically significant in severe pneumonia children. Mortality was higher among the patients who had DLH (Days live in hospital) hospital less than 72 hours of onset of illness (p=0.0001).it mean those were in hospital for ≤3days died soon. Also children with cyanosis, convulsion, no conscious, fever, (p value=0.0001) wheezing (p value = 0.014), those who need for O2 (p value =0.03) died more than who doesn't need for oxygen , 288(62.3%) X-ray not done and for remain 174(37.7%)x-ray was done for them .

Descriptive Statistics						95% CI	
Characteristic	N	Minimum	Maximum	Mean	Std. Deviation		
Age	462	2	54	9.22	7.775	8.46	9.96
Weight per kg	462	2	18	6.11	2.074	5.92	6.30
Height per cm	462	48	102	65.59	8.358	64.76	66.34
Age of mother in years	462	18	45	28.72	5.722	28.23	29.25
Number of family members	462	3	62	15.53	9.319	14.72	16.43
Number of members per room	462	2	14	5.43	1.707	5.26	5.58

Number of Under five children at home	462	1	22	3.32	1.999	3.15	3.51
Number of Under five children per room	462	1	4	2.05	.625	1.99	2.10
Fever	462	35	42	37.79	.837	37.71	37.86
Duration of breast feeding in months	462	0	24	4.45	4.973	3.99	4.94
Number of smokers at home	462	0	4	.52	.784	.44	.59
Heart Rate per minute	462	108	250	147.71	17.755	145.98	149.24
DLH	461	1	19	5.74	3.205	5.49	6.07
Respiratory Rate per minute	462	50	104	68.16	8.968	67.24	68.96
MCV	456	45.5	99.3	69.362	10.1521	68.504	70.314
Neutrophils Percentage	456	13.00	93.10	61.9882	14.32249	60.6832	63.2959
TLC Thousands per M3	456	3	83	18.24	8.501	17.46	19.03
Lymphocytes Percentage	456	5.4	74.3	31.160	13.2834	29.936	32.370
HB Gram per dl	456	3.6	16.7	10.369	1.6819	10.222	10.528
MCH	456	9.8	72.7	25.449	5.6304	24.981	25.993

[Table/Fig-1]: Descriptive Statistics.

Discussion

In our study, most cases of severe pneumonia i.e., 380 (82.4%) were reported in the age group of 2 months-12 months. Which has same result with the done in rural western Nepal also found occurrence of pneumonia more in the age group below one year as compared to age group one year-five year (6) Male to female ratio in our study was 1.24:1. Similar observations in a similar study in Karnataka, India, observed 62.6% were males and 37.4% were females (ratio 1.67:1). More number of male cases were admitted for treatment of

pneumonia in the age group of under-five. This might be due to preferential treatment given to male child in family in our society. (7) More cases were admitted during the first quarter (months of January, February and March) and also quarter 4 (October, November and December). In winter and fall which rainy and dry season respectively. Which is same result with WHO 2008 data also reported peak occurrence of pneumonia in the rainy season in tropical climates. There was similar trend in our study as per seasonal distribution. (8). In the present study Out of 462 patient the patients 199 (43%) included in the study had malnutrition out of malnutrition children 132(28.57%) had severe malnutrition. and a study from Kolkata showed also the similar result that malnutrition was significantly associated with occurrence of Acute Respiratory Infection (ARI) among under-five children (9). In our study, About 103 (22.2%) patients were completely immunized regarding to their age, 51(11%) didn't take any vaccination and the remaining 308(66.5) were partially vaccinated. This difference might be due to problem in different aspect of immunization (as per NIS nation immunization schedule) coverage in our study area as well as lack of awareness and negative mind among parents. In our study, 167 (36.1%) patients were exclusively breastfed, this low figure of exclusive breast feeding in our studied cases could be due to poor awareness of benefits of exclusive breast feeding among mothers. Average hospital stay among survivors was 5.74±3. 2 days where as among the non survivors it was ≤3 days. in a study from Karnataka observed that duration of hospital stay was more in very severe pneumonia group. in our study The duration of hospital stay was less in very severe pneumonia group, because more number of deaths occurred early due to more serious nature of illness (9). Overall mortality in our study was 57 (12.75%) due to severe pneumonia. Mortality seen in severe pneumonia was 9 (6.38%) and in very severe pneumonia was 22 (15.6%). (10) in study of Kumar AMK et al 2017 Clinical profile and outcome of acute lower respiratory tract infection in children aged between 2 months to 5 years observed mortality of 3%. The higher mortality rate observed in our study could be due to more number of very severe pneumonia cases in contrast to their study population. More seriousness of the illness as well as delay in reaching in Mirwais regional referral hospital could be another attributing factor (10)

Multivariate Logistic Regression Model for factors associated with pneumonia mortality								
	B	S.E.	Wald	Df	P-value	Odd Ratio (OR)	95% C.I. for OR	
							Lower	Upper
Cyanosis	1.604	.560	8.195	1	.004	4.974	1.7	14.9
Consciousness	1.944	.591	10.815	1	.001	6.988	2.2	22.3
Refuse to feed	1.723	.660	6.821	1	.009	5.604	1.5	20.4
X-rays done	-1.858	.650	8.179	1	.004	.156	0.04	0.6
Admission days			45.250	2	.000			
4-7 days	-3.622	.591	37.514	1	.000	.027	0.02	0.09
≥7 days	-6.200	1.160	28.573	1	.000	.002	0.000	0.020
Mother age			9.841	2	.007			
30-40 years	-1.203	1.119	1.156	1	.282	.300	0.03	2.7

>40 Years	.614	1.099	.312	1	.577	1.847	0.2	15.9
Antibiotics given at hospital			21.166	7	.004			
Ampicillin +Gentamicin	-6.916	2.147	10.374	1	.001	.001	0.000	0.06
Ampicillin + Ceftriaxone	-6.805	2.045	11.076	1	.001	.001	0.000	0.06
Benzyl Penicillin +Ceftriaxone	-1.019	2.198	.215	1	.643	.361	0.01	26.8
Amikacin + Ceftriaxone	-6.697	2.191	9.341	1	.002	.001	0.000	.019
Vancomycin + Ceftriaxone	-4.999	2.081	5.768	1	.016	.007	0.000	0.4
Ceftriaxone+ Gentamicin	-6.488	2.149	9.119	1	.003	.002	9.000	9.10
Benzoyl penicillin + Gentamicin	-22.226	18450.009	.000	1	.999	.000	.000	.
Constant	4.816	2.341	4.234	1	.040	123.516		

a. Variable(s) entered on step 1: Cyanosis, Countiousness1, Refuse feeding, X_Ray1, Admission Days, Mother_Age_Cat, Antibiotics hospital.

[table/Fig-2]: Factors associated with pneumonia mortality.

Conclusions

The prevalence of severe pneumonia was high in infancy. More number of patients died who arrived at hospital after 72 hours of onset of illness and most death were recorded in children who had severe pneumonia. Respiratory diseases still constitute some significant burden to children. Attention should be paid to respiratory diseases in children to reduce the morbidity in the population. A comprehensive study in the community on the epidemiological factors associated with morbidity and mortality should be undertaken in order to determine the prevalence and plan interventions on management of the diseases.

Limitation

This was a hospital based study and does not represent the true prevalence of severe pneumonia and its different forms and etiologies of the entire population.

Acknowledgements

References

1. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE, et al. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet. 2015;385(9966):430–40.

2. Rohit C Agrawal. Pneumonia. A Parthasarathy. IAP Text book of Pediatrics. 5th ed. Jaypee Brothers Medical Publishers (P) Ltd. 2013;8.6:470-74

3. Black RE, Cousens S, Johnson HL, Lawn JE, Rudan I, Bassani DG et al. Global,   regional, and national causes of child mortality in 2008: a systematic analysis. The Lancet. 2010 Jun 5; 375(9730):1969-87

4. Fischer Walker CL, Rudan I, Liu L, et al. Global burden of childhood pneumonia and diarrhoea. Lancet2013; 381:1405–16.

5. Rudan I, Boschi-Pinto C, Biloglav Z, Mulholland K, Campbell H. Epidemiology and aetiology of childhood pneumonia. Bull World Health Organ. 2008;86(5):408-416.

6. Banstola A, Banstola A. The Epidemiology of Hospitalization for Pneumonia in Children under Five in the Rural Western Region of Nepal: A Descriptive Study. PLoS ONE. 2013 August;8(8):e71311.

7. Divyarani DC, Goudappa R Patil, K Ramesh. Profile on risk factors of pneumonia among Under-five age group at a Tertiary care hospital, International Journal of Current Microbiology and Applied Sciences. 2014;3(6):750-54.

8. Rudan I, Boschi-Pinto C, Biloglav Z, Mulholland K, Campbell H. Epidemiology and aetiology of childhood pneumonia. Bull World Health Organ. 2008;86(5):408-416.

9. Kumar AMK, Badakali AV, Mirji G, Vanaki RN, Pol R. Clinical profile and outcome of acute lower respiratory tract infection in children aged between 2 months to 5 years. International Journal of Contemporary Pediatrics. 2017;4(1):105-09.

10. Kumar AMK, Badakali AV, Mirji G, Vanaki RN, Pol R. Clinical profile and outcome of acute lower respiratory tract infection in children aged between 2 months to 5 years. International Journal of Contemporary Pediatrics. 2017;4(1):10

5-09.