X-RAY CHEST FINDINGS IN CHILDREN AGED 2 MONTHS TO 59 MONTHS CLASSIFIED AS PNEUMONIA ACCORDING TO IMNCI GUIDELINES

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ABSTRACT

Objective: To determine the x-ray chest findings in children aged 02 months to 59 months classified as pneumonia according to IMNCI guidelines.

Study Design: Descriptive case series.

Place and Duration of Study: This descriptive case series study of six months was carried out in the Department of Pediatric Medicine, Liaquat University Hospital Hyderabad.

Material and Methods: The study was conducted on the children who met the inclusion as well as exclusion criteria of the study. All the patients presented with history of cough and/or difficult breathing, on physical examination having (i) fast breathing (respiratory rate >50/min if age 2-11 months, rate >40/min if age 12-59 months) or (ii) lower chest wall in-drawing was admitted in the ward and further evaluate for x-ray chest findings specific for pneumonia by advising chest radiograph.

Results: The mean age of the patients was 11.2 ± 5.6 months with age range of 02-59 months. There were 92 (55.8%) male and 73 (44.2%) female patients. There were 64 (38.8%) patients who had consolidation and 66 (40%) patients had reticular shadowing on chest x-ray.

Conclusion: It is concluded from this study that considering/ evaluating x-ray chest findings in children according to IMNCI guidelines was a better approach for diagnosing pneumonia. This would certainly contribute towards evidence based clinical assessment of suspected cases of pneumonia.

Keywords: IMNCI guidelines, Pneumonia, X-ray chest findings.

INTRODUCTION

Pneumonia is defined as an acute disease episode with cough and/or difficult breathing combined with fast breathing with age specific cut-off values for increased respiratory rate and/or lower chest wall indrawing[1,2]. It is responsible for about 21% of all deaths in children aged less than 05 years, leading to estimate that of every 1000 children born alive, 12-20 die from pneumonia before their fifth birthday[2], It continues to be the second leading cause of death among children in Pakistan. Khan et al reported that prevalence of pneumonia in Pakistan is 27%[3]. The physical signs of pneumonia include fever in 80% of patients and most have a respiratory rate exceeding 20 breaths/minute, crackles are heard on auscultation in 80% and up to 30% have signs of consolidation[4]. The accurate diagnosis of pneumonia in children remains an important yet difficult clinical problem and the IMNCI guidelines based on the clinical parameters for diagnosing pneumonia and follow up of these guidelines has resulted in 30-40% reduction in mortality from pneumonia[5,6]. The proportions of clinical signs are cough (99%), fever (41%), fast breathing (100%) in the study by Khan et al[3]. An x-ray chest is the ultimate criteria for confirmation of pneumonia and the prominent findings are consolidation in 34% children and reticular shadowing in 30% children in the study by Bada et al and Magree et al[7,8].

In the context of aforesaid findings, the present study will be conducted at tertiary care hospital by focusing on the x-ray chest (radiological) findings in children with pneumonia according to IMNCI guidelines. Therefore this study will follow the IMNCI

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guidelines in the evaluation of the x-ray chest findings in patients with pneumonia that will help the pediatrician in contextualizing evaluating the pattern of those findings in our population. This will ultimately help the paediatricians in formulating management strategies empirical treatment modalities for lobar/lobular consolidation seen in bacterial infection, interstitial consolidation seen in atypical mycoplasma and viral infections.

PATIENTS AND METHODS

This descriptive case series study of six months was carried out in the department of pediatrics Liaquat University Hospital Hyderabad. The sample size was calculated by considering prevalence of reticular shadowing chest (x-ray=30%[12], d=7% and n=165 children with pneumonia). The sample technique was non-probability purposive sampling. The inclusion criteria of the study were the children with the age 02-59 months of either gender presenting with cough and/or difficult breathing of <4 weeks duration, on examination having fast breathing (respiratory rate >50/min if age 2-11 months, rate >40/min if age 12-59 months) or lower chest wall in-drawing while the exclusion criteria were children with known case of bronchial asthma/recurrent wheeze, known congenital heart disease and congenital anomaly that may affect association, any general danger signs (lethargic, unconscious, convulsing now) and/or stridor and non-cooperative parents who refused to give consent for the participation in the study. The study was conducted on the children who met the inclusion as well as exclusion criteria of the study. All the patients presented with history of cough and/or difficult breathing, on physical examination having (i) fast breathing (respiratory rate >50/min if age 2-11 months, rate >40/min if age 12-59 months) or (ii) lower chest wall in-drawing admitted in the ward and further evaluated for x-ray chest findings (mentioned in operational definition) specific for pneumonia by advising chest radiograph. The chest x-ray film were reviewed by consultant pediatrician of ward having >5 years clinical experience for the diagnosis and pattern of x-ray chest findings (consolidation or reticular shadow) specific for pneumonia. A written informed consent was taken from parents of the patient for the participation in the study and the data was collected on pre designed proforma and analyzed by using SPSS version 15. The frequency and percentage (%) were computed for x-ray chest

Table-I: Distribution of patients by age (n=165).

Age (Months)	N = 165	Percentage (%)
1-12	119	72.1
13-24	26	15.8
25-36	14	8.5
37-48	4	2.4
49-59	2	1.2
Mean ± SD	11.2 ± 5.6	

Table-II: Distribution of patients by gender (n=165).

Gender	n=165	Percentage (%)
Male	92	55.8
Female	73	44.2
Total	165	100.0

Table-III: Distribution of patients by reticular shadowing on chest X-Ray (n=165).

Reticular shadowing	n=165	Percentage (%)
Yes	66	40.0
No	99	60.0
Total	165	100.0

findings (consolidation and reticular shadowing) in children classified as pneumonia, lower chest wall in drawing, fast breathing as well as for gender distribution. The mean and standard deviation (SD) were calculated for age and respiratory rate.

RESULTS

Out of 165, the mean age of the patients was 11.2 ± 5.6 months with age range of 02-59 months. There were 119 (72.1%) patients in the age range of 1-12 months, 26 (15.8%) patients in the age range of 13-24 months, 14 (8.5%) patients in the age range of 25-36 months, 4 (2.4%) patients in the age range of 37-48 months and 2 (1.2%) patients in the age range of 49-59 months (table-I). In the distribution of patients by sex, there were 92 (55.8%) males and 73 (44.2%) females patients (table-II). In the distribution of patients by consolidation, 64 (38.8%) patients had consolidation on chest x-ray and 101 (61.2%) patients had no consolidation on chest x-ray. The distribution of patients by reticular shadowing is shown in table-III.

DISCUSSION

In current study the mean age of the patients was 11.2 ± 5.6 months with age range of 02 to 59 months. As compared with the study of Hazir et al[9] who also evaluated chest radiographs of children aged 2-59 months with mean age of 13 months, which is comparable with our study.

In present study there were 55.8% male and 44.2% female patients. As compared with the study of Hoare et al[10] there were 60% male and 40% female patients. In another study conducted by O'Grady et al[11] there were 53.9% male and 46.1% female patients, which is comparable with our study. In our study there were 58.8% patients had consolidation on chest x-ray. As compared with the study of Singh et al[12]. A total of 30% patients had consolidation on chest x-ray. In another study conducted by Anevlavis et al[13] consolidation on chest x-ray was found in 34% patients, which is comparable with our study. In our study 90.9% patients had reticular shadowing on chest x-ray. In a study by Ebby O[14] 30% patients had reticular shadowing, which is also comparable with our study. As is evident from the foregoing discussion, considering x-ray chest findings in children is a better approach in diagnosing pneumonia according to IMNCI guidelines. This strategy can also help the pediatrician in formulation of management protocols according to the type of chest radiograph (X-Ray) finding i.e. consolidation and reticular in our population.

CONCLUSION

It is concluded from this study that considering/ evaluating x-ray chest findings in children according to IMNCI guidelines was a better approach for diagnosing pneumonia. This would certainly contribute towards evidence based clinical assessment of suspected cases of pneumonia.

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CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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