



ORIGINAL RESEARCH PAPER

Paediatric Medicine

IDENTIFICATION OF ACYANOTIC CONGENITAL HEART DISEASE IN CHILDREN UNDER 5 YEARS OF AGE PRESENTING WITH SEVERE PNEUMONIA USING 2D ECHO IN TERTIARY CARE CENTRE – A CROSS SECTIONAL STUDY

KEY WORDS: Congenital heart disease, severe pneumonia, congestive heart failure, pulmonary hypertension

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ABSTRACT

Pneumonia is major cause of childhood morbidity and mortality worldwide, this is even more common in developing countries and in under five years of age. Acute respiratory infections may cause inflammation of respiratory tract anywhere from nose to alveoli with wide range of combination of symptoms and signs. Pneumonia and congestive cardiac failure may be the first sign of an underlying CHD. Age of onset of symptoms and severity in children with CHD is dependent on the size of the defects, children with large size VSD and PDA tend to present early and have more severe disease including pneumonia. **Material And Methods:** Patients under 5 years of age, presenting with pneumonia to Vanivilas hospital BMCRI Bangalore, during March 2023- October 2023 and whose parents willing to consent were enrolled for study. The bio-data of each patient was documented each patient was clinically evaluated thoroughly and findings noted. Pneumonia was diagnosed on typical history, physical findings, blood investigations and chest radiographic finding of pneumonia infiltrates in either one or both lung fields. All the cases of pneumonia underwent transthoracic 2 Dimensional (2D) and Doppler echocardiography. **Results:** This study showed that prevalence of CHD in 1st episode of severe pneumonia was 37%, among that more than 50% were malnourished. This study concluded that there is coexistence of pneumonia with CHD

INTRODUCTION

Pneumonia is inflammation of any part of the lung parenchyma³, it is a form of acute respiratory infection that affects the lungs. The lungs are made up of small sacs called alveoli, which fill with air when a healthy person breathes. When an individual has pneumonia, the alveoli are filled with pus and fluid, which makes breathing painful and limits oxygen intake.

Pneumonia is the single largest infectious cause of death in children worldwide. Pneumonia killed 740 180 children under the age of 5 in 2019, accounting for 14% of all deaths of children under 5 years old but 22% of all deaths in children aged 1 to 5 years. Pneumonia affects children and families everywhere, but deaths are highest in southern Asia and sub-Saharan Africa. Children can be protected from pneumonia, it can be prevented with simple interventions, and it can be treated with low-cost, low-tech medication and care. Congenital heart disease (CHD)⁶ is defined as a gross structural abnormality of the heart or intra thoracic great vessels that is actually or potentially of functional significance. In congenital heart diseases (CHD) such as acyanotic CHD, because of a left to right shunting of blood, via a septal defect or the arterial duct, there is pulmonary over circulation and pulmonary edema. The pulmonary oedema leads to congestive heart failure and becomes a nidus of infection for the lower respiratory tract infection. Ventricular septal defect (VSD), patent ductus arteriosus (PDA) and atrioventricular septal defect (AVSD) are common acyanotic CHD in childhood that predispose to bronchopneumonia²

The incidence of congenital heart disease (CHD) in the general population is about 1% and varies from 4/1000 to 50/1000 live births (1). Children with CHD have many complications concerning all of the organ systems, the respiratory system being the most important. Lower respiratory tract infection (LRTI) is a serious mortality and morbidity reason for children with CHD. Hemodynamically significant-CHD (HS-CHD) with pulmonary congestion poses a higher risk for LRTI and hospitalizations⁴

MATERIAL AND METHODS:

Patients under 5 years of age, presenting with pneumonia to Vanivilas hospital BMCRI Bangalore, during March 2023- October 2023 and whose parents willing to consent were enrolled for study. The bio-data of each patient was documented each patient was clinically evaluated thoroughly and findings noted. Pneumonia was diagnosed on typical history, physical findings, blood investigations and chest radiographic finding of pneumonia infiltrates in either one or both lung fields. All the cases of pneumonia underwent transthoracic 2 Dimensional (2D) and Doppler echocardiography, done by the cardiologist. Any congenital heart disease so found was noted. CCF was diagnosed when the patient fulfilled the clinical diagnostic criteria of heart failure. All the cases of pneumonia underwent transthoracic 2 Dimensional (2D) and Doppler echocardiography for diagnosis of any congenital heart disease.

Case Study:

The present study undertaken to detect the association of CHD with severe pneumonia in children less than 5 year old admitted to tertiary care center Bangalore medical college and research center. During this 8 months period, 96 were included in the study 46 (47.91%) were male and 50 (52%) were female. Among 96 children with severe pneumonia 36 were found to be having CHD accounting for 37.5%.

Table 1

	Without CHD	WITH CHD	P value
AGE: 1-59 months	60(62.5%)	36 (37.5%)	
Malnutrition	20	24	0.0002
CCF	7	20	0.000
Mean duration of hospital stay	5.2 +/- 2.5 days	8.5 +/- 2.5 days	0.0001

Table 2

TYPES CHD	WITH CHF	NO CHF	
ASD	8	12	20(55%)
ASD,VSD	4	1	5(13.8%)
ASD,PDA	1	1	2(5.5%)
VSD	4	2	6(16.7%)

VSD,PDA	1	0	1(2.7%)
PDA	2	0	2(5.5%)
TOTAL	20	16	36(100%)

CONCLUSIONS:

This study showed that prevalence of CHD in 1st episode of severe pneumonia was 37%, among that more than 50% were malnourished. This study concluded that there is coexistence of pneumonia with CHD and had increased the morbidity in the form of development of secondary malnutrition, prolonged hospital stay. This study outlines the importance of very high index of suspicion, early identification and intervention of CHD in children presenting with pneumonia.

Recommendation:

Routine cardiac screening by 2D echo for all severe pneumonia at 1st episode in children is recommended for early recognition of CHD.

Limitations: Small Sample Size.

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