Original Research Article

Clinical manifestations and evaluation of bronchiectasis in children at a tertiary care hospital

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Abstract

Background: Bronchiectasis is a chronic pulmonary disease characterized by progressive and irreversible bronchial dilatation. The aim of this study was to determine the clinical charactaristics and radiological findings of children with bronchiectasis at a tertiary care hospital in kurnool. **Materials:** A retrospective review of the case histories of all children of aged up to 12 years at tertiary hospital in kurnool with bronchiectasis diagnosed by high-resolution chest computed tomography (CT) scan, during the period June 2019- June 2020 was undertaken. Data collected included patient demographics, clinical characteristics, radiology findings and sputum culture. **Results:** the median age at the time of the diagnosis of bronchiectasis was 6.2 years (range, 2 months to 18 years) and Male children (51%) being slightly more. Bronchiectasis occurs predominantly in lower socio-economic population (96%). The common symptoms and signs in these children are cough (100%), Cough and expectoration (60%), dyspnea (51%), loss of weight(40%) clubbing(39%) wheeze (23%)lymphadenopathy(27%) pallor(19%) chest pain(11%) fever (9%),vomiting (9%), and hemoptysis (9%) **Conclusion:** Our present study findings provide the fundamental information on the current state of bronchiectasis in children and will be helpful in establishing future management and evaluation strategies for this condition in children.
Key words: Breathlessness, Bronchiectasis, Cough, expectoration, fever, Hemoptysis.

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INTRODUCTION

Bronchiectasis is a pulmonary disorder defined morphologically as permanent bronchial dilatation. This disease is the end result of a pathological process involving a vicious circle of inflammation, recurrent infection and bronchial wall damage caused by a number of primary diseases.[1-5] Bronchiectasis affects the quality of life of the affected children and their parents, particularly during periods of acute exacerbation, combined with decreased pulmonary function at follow-up.[6,7] Chest high resolution computer tomography (cHRCT) is the proper diagnosis test for bronchiectasis,[8] Congenital malformation, cystic fibrosis, or immune deficiency are multiple etiologies and are often associated with underlying conditions for Bronchiectasis.[9] Globally, over the last 50 years has declined the prevalence of CSLD with the use of antibiotics, immunizations, improved hygiene, nutrition, and access to medical care in developed countries.[8] However, among socially underprivileged populations of developed countries the substantial burden of CSLD in children,[8,10] and with the extent of pediatric CSLD in developing countries largely unknown. In recent years, there has been a growing awareness of CSLD related to the increased use of HRCT diagnostics and emerging research into the etiology, microbiology, immunology, and clinical management, yet, robust epidemiological data remain sparse.[8,11,12] Early diagnosis and intensive treatment protocols can stabilize or even improve the clinical prognosis of children with bronchiectasis.[13] The present study was taken up to find out the clinical manifestations

and evaluation of bronchiectasis among children in kurnool district, India.

MATERIALS AND METHODOLOGY

A retrospective study was done at department of paediatrics department of tertiary care hospital Kurnool between June 2019 and June 2020 after getting approval from the institutional ethics committee. 94 children aged up to 12 years who were diagnosed with bronchiectasis at tertiary care hospital were included in the study. Cases of bronchiectasis were identified by screening the clinical records and Data analysis in terms of age at onset, initial presenting symptoms, distribution of pulmonary involvement on computed tomography (CT), and causative microbiological flora triggering secondary infections was performed. Diagnosis of bronchiectasis was based on findings in high resolution computerized tomography (HRCT) of chest. The details of these children were collected through a structured proforma and statistical analysis was done.

Statistical analysis: Number and percent (*n*, %) were used to describe categorical variables while mean ± standard deviation (mean ± SD) was used to describe continuous variables

RESULTS

94 patients participated in our study. Median age of the patients was 6.2 years (range, 2 months to 12 years). Males outnumbered females. forty-eight (51%) of the total number of children were males and forty-six (49%) were females. In the study population 45% of all the patients were between the age group of 0 and 6 years and 55% of all the children were between the age group of 7 and 12 years. Table:1

Table 1: age and sex distribution of the study population.

Age (years)	Male	Female	Total
0-3 yrs	11	8	19 (20%)
4-6 yrs	11	14	25 (25%)
7-9 yrs	14	14	28 (30%)
10-12 yrs	13	11	24 (25%)
Total	**48 (51%)**	**46 (49%)**	**94(100%)**

At the time of the bronchiectasis diagnosis, the main symptoms and signs were cough (100%), Cough and expectoration (60%), dyspnea (51%), loss of weight(40%) clubbing(39%) wheeze (23%)lymphadenopathy(27%) pallor(19%) chest pain(11%) fever (9%),vomiting (9%), and hemoptysis (9%) (Table 2).

Table 2: symptoms and signs of bronchiectasis

	Total (N=94)	Percentage (%)
cough	94	100
Cough and expectoration	56	60
Breathlessness	48	51
Loss of weight	38	40
clubbing	37	39
lymphadenopathy	25	27
wheeze	22	23
pallor	18	19
hemoptysis	8	9
Fever	8	9
vomiting	8	9

Distribution of bronchiectasis

The distribution of bronchiectasis assessed by chest CT is shown in Table 3. It was found that in the age group of 10-12 years, left lung was involved. In the age group of 0 to 6 years, Right lung was mainly involved. But over all right lung was commonly involved, affecting 42 (45%) patients. Left lung was involved in 28 (30%) patients. Twenty-four patients (25%) had bilateral involvement. Table 3.

Table 3: Radiological Findings in Bronchiectasis in study population.

	Right 42 (45%)				Left28 (30%)				Bilateral 24(25%)
	Upper Lobe	Middle Lobe	Lower Lobe	Middle Lobe and Lower Lobe	Upper	Middle	Lower	Middle Lobe and Lower Lobe	
0-3 Yrs	-	-	11	3	-		4	-	3
4- 6 Yrs	1	-	8	3	1		5	2	10
7-9 Yrs	1	-	3	5	-		7	2	4
10-12 Yrs	3	-	4	-	-		13	5	7
Total	**5**	**-**	**26**	**11**	**1**		**18**	**9**	**24**

Among the total of 94 cases 54 children were subjected for sputum culture analysis of which 8 (15%) cases had Klebsiella growth in their sputum. Mycobacterium growth was seen in 6(11%) cases and streptococci growth was seen in 4 (7%) cases. While 1 (2%) had pseudomonas growth. 34 (66.7%) had no pathogenic growth in their sputum (Table 4).

Table 4: showing the sputum culture in bronchiectasis (n=54).

Growth	total
Klebsiella	8 (15%)
Streptococci	4 (7%)
Mycobacterium	6 (11%)
Pseudomonas	1 (2%)
No growth	35 (65 %)

Table no 5 Showing the social economic status – modified Kuppuswamy scale. 57% of the total study population were belonged to class IV socio economic class and 38% of the total belonged to class III socio economic class. None of the children belonged to class I socioeconomic class

Table 5: Showing the social economic status modified kuppuswamy scale.

	Rural	urban	Total (n) percentage(%)
Class-I	-	-	-
Class-II	1	3	4 (4.2%)
Class-III	13	23	36 (38.3%)
Class-IV	28	26	54 (57.5%)

DISCUSSION

Bronchiectasis is a chronic lung disease characterized by abnormal permanent dilatation of one or more segmental bronchi with accumulation of exudative material resulting in chronic cough and foul-smelling sputum. It is an important cause for chronic cough in children. In our study population, 94 children with bronchiectasis were included of which, Males outnumbered females. Forty eight (51%) of the total number of children were males and forty six (49%) were females. Hanaa Hasan Banjar, *et al.*[14] In their study of 151 cases of bronchiectasis, reported the sex distribution 49.7% were males and 50.3% were females. In the present study, cough was the common complaint (100%), Breathlessness was one of the major complaints (51%). and Lymphadenopathy was seen in 27.0%. In their study, Hanaa Hasan Banjar *et al.*[14] where they have studied 151 cases of bronchiectasis had similar findings. k k khanna, *et al.*[15] in their study reported the similar findings. In this study, bronchiectatic lesions were identified most commonly in the left lower lobe, followed by the right lower lobe and left upper lobe In our study sputum culture was done for 54 cases and it was found that kliebsiella growth was seen in 8 (15%) cases. Mycobacterium growth was seen in 6 (11%) of cases and streptococci growth was seen in 4 (7%) of cases. While one (1.9%) had pseudomonas growth. 35 (65%) had no pathogenic growth in their sputum. In the study by Hanaa Hasan Banjar, *et al.*[14] Hemophilus influenza was cultured in 56 (37%), strept pneumoniae in 25(17%) and pseudomonas aeruginosa in 24 (16%) of the patients. In our study Kliebsiella growth was more commonly seen than the other bacterial culture this disparity could be due to variability in the prevalence of the pathogenic organisms at different places. In our study, Urban population (55%) was more compared to rural population (45%). Majority of the children belonged to class IV socio-economic class (according to modified Kuppuswamy scale) constituting about 57.5% of the total study population and 38.3% of the total belonged to class III socio-economic class. None of the children belonged to class I socioeconomic class.

CONCLUSION

In the present study, the Bronchiectasis was diagnosed in all the age groups up to twelve years of age. Our present study findings provide the fundamental information on the current state of bronchiectasis in children and will be helpful in establishing future management and evaluation strategies for this condition in children.

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