

ORIGINAL ARTICLE

Respiratory Tract Lesions in Infants and Children- An 8 Years Study in Tertiary Health Centre

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Abstract

Aims: To study the pathology of various lesions of respiratory tract in infants and children and to determine incidence of respiratory lesions contributing to death. **Methods:** The observational study of 8 years duration included paediatric age group up to 18 years. A detail study of respiratory lesions in infants and children was done on the material received at the histopathology department and autopsy section. The respiratory tract lesions studied were correlated with age, gender and clinical history. **Results:** Out of the total cases received in histopathology and autopsy section respiratory tract lesions of paediatric age group contributed to 152 cases. Total autopsies conducted were 568, out of these 103 were paediatric autopsies contributing to 18.3%. Neonatal autopsies contributed to 2.4%. Male preponderance was noted contributing to 57%. Most common clinical presentation were fever, cough and breathlessness. The majority of primary lung pathology was infective etiology and common age group affected was less than 5 years, hence maximum mortality was noted in this age group. Bronchopneumonia was the commonest pathology observed followed by tuberculosis of lung. Other cases that contributed to minor percentage were congenital adenomatoid malformation, nasal polyps, fungal infections, hydatid disease and hemangiomas. **Conclusion:** Primary infective lung pathology predominated in infants and children followed by developmental anomalies. Bronchopneumonia constitutes majority of the cases followed by tuberculosis. This study intends in improving the management and treatment of respiratory lesions by early diagnosis in pediatric patients and also preventing morbidity and mortality caused by these preventable diseases.

Keywords: Histopathology, autopsy, respiratory infections, infants, children, congenital anomalies

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Introduction

Patterns of lung diseases vary widely all over the world. Acquired diseases such as infections depend on the habits and environment of the people. Children form a major part of Indian population. 31% of the Indian population is under the age of 15 years.¹This group is most vulnerable and has increased risk for infections. Paediatric respiratory disease is a major cause of morbidity and mortality in developing countries accounting for large proportion of hospitalization and health care visits. Acute respiratory infections cause 1.6-2.2 million deaths globally in children under 5 years old, every year, the overwhelming majority

occurring in developing countries.²Deaths in children are mostly seen under the age of 5 years.17% of these deaths are due to respiratory infections like pneumonia. Congenital anomalies, transplacental infections are seen only in neonates and young children. Autopsies play a role in detection of misdiagnosis. It helps the clinicians to gain an insight into the occurrence, features and clinical manifestations of rare diseases.

Aims and Objectives

- 1) To study the pathology of various lesions of the respiratory tract in infants and children.
- 2) To study the clinical presentation of these lesions.

3) To correlate radiological findings with common pathological patterns encountered.

imaging appearance. These cases were given confirmatory diagnosis on histology and special stains wherever needed.

Materials and Methods

A detailed study of respiratory lesions in infants and children was done on the material reviewed at the histopathology department and autopsy department over a period of 8 years. Case histories were studied wherever possible from the hospital records. Post-mortem reports were also studied wherever available. The cases were referred to histopathology department with a primary imaging diagnosis of lesion, which were further sub classified as developmental, non-infective and infective depending upon the

Results

The present study included paediatric autopsies conducted over a period of 8 years. Table 1 shows that the total number of autopsies done over the period of 8 years including adult and paediatric, in our institution were 568, out of which paediatric autopsies were 103 contributing 18.13% of all autopsies. In 98 cases (95.10%) lung pathology was the causes of mortality. 14 neonatal autopsies were conducted contributing to 2.4%.

	Present study	Comparative study
1	Pediatric autopsy- 18.13% Neonatal autopsy-2.4% Pediatric autopsies with lung pathology-95.10%	Majethia Nikhil K et al ¹⁰ 17.7% 3.4% 97.3%
2	Children <1 year- 21.05% 1-5years- 33.2%	Bipin Prajapati study ¹¹ 29% 67%
3	Male-57% Female-43%	Bipin Prajapati study ¹¹ 56.3% 43.7%
4	Age distribution of pneumonia Age group <5 years-62.9% Age group 5-15 years- 34.2%	C. Jokinen et al ¹² 36 per 1000 16.2 per 1000
5	Tuberculosis Median age- 7 years M:F ration- 1:1.6	Sharda MP, Maria Nelliyanil ¹³ 8 years 0.6:1

In our study 16 cases belonged to the neonatal period (10.50%), 16 cases were in infants (10.50%), 44 cases in children from 1 year to 5 years (29%), 38 cases in 5 years to 10 years (25%), 25 cases in 10 years to 15 years (16.50%) and 13 cases in 15 years to 18 years (8.50%).

The numbers of children affected in age group less than 1 year were 32 (21.05%). Children affected with respiratory lesions in the age group of 1- 5 years were 44 (29%).

In our study numbers of males affected were 86 (57%) and numbers of females affected were 66 (43%). Fever with cough contributed to 24%, fever with cough with breathlessness contributed to 17% and other symptoms contributed to 32%.

Pneumonia was the most predominant respiratory tract infection in primary and secondary lung pathology was pneumonia accounting for 70 cases out of 152 cases thus contributing to 46.05%.out of the total 70 pneumonia cases, 44 cases (62.9%) were in age group less than 5 years. 15 cases (21.4%) were in age group of 5years to 10 years. 9 cases (12.8%) were in age group of 10 years to 15 years and 2 cases (2.9%) in age group of 15- 18 years. The chart also shows male predominance contributing to 44 cases (62.85%). Mortality due to pneumonia was predominantly seen in age group less than 5 years (38 cases out of 63 cases) contributing to 60.3%.

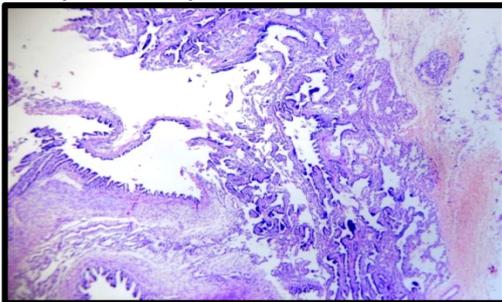
Total 18 cases of tuberculosis were studied (11.84%). Median age was 7 years. Youngest child was 6 month old. Females affected were predominantly affected with male to female

ratio of 1:1.6. Total cases with pulmonary tuberculosis were 18 (100%), out of which 10 cases (55.5%) showed extra-pulmonary tuberculosis. Among the extra-pulmonary tuberculosis, abdominal tuberculosis contributed to 3 cases (30%) and pleural effusion was seen in 7 cases (70%). There were 5 cases of fungal etiology. 2 cases of nasal rhinosporidiosis, 2 cases of aspergillosis and 1 case of extensive cryptococcal infection were studied. 3 cases of pulmonary hydatid cysts were studied.

We also encountered some of the rare cases and congenital malformations.

CPAM (Congenital pulmonary airway malformation)

Congenital cystic adenomatoid malformations (CCAM) also known as congenital pulmonary airway malformation is a developmental, non-hereditary, hamartomatous abnormality of lung with unknown. It is a disease of infancy with most of the cases diagnosed within first 2 years of life.^{4,5} Total 4 cases of CPAM were studied. Common age group involved being less than 2 years. Male and female were equally affected in our study. Mortality was seen in 1 case.



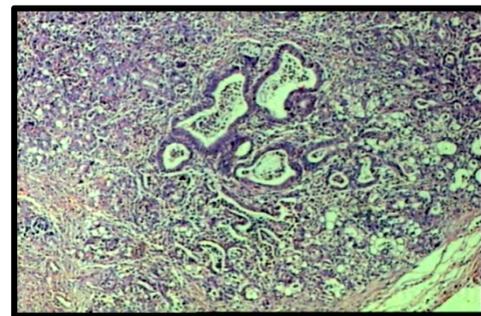
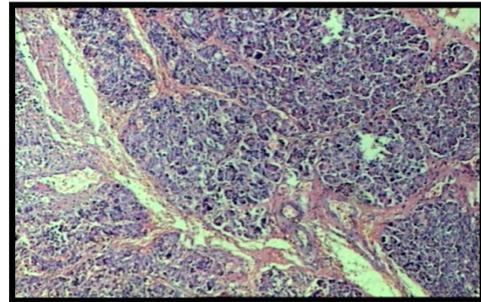
Congenital pulmonary airway malformation-Back to back arrangements of bronchial like structures.

Nasal Glial Heterotopia

Encephaloceles and gliomas have a similar embryologic origin but as the encephalocele is a herniation of cranial contents through a defect in the skull, a glioma is thought to be an encephalocele that has lost the intracranial connection. Heterotopic central nervous system tissue may occur at other sites, such as the paranasal sinuses, nasopharynx, tongue, palate, tonsils and orbit and may be referred to as facial glioma.^{6,7} A case of nasal glial heterotopia was studied.

Bronchopulmonary Foregut Malformation

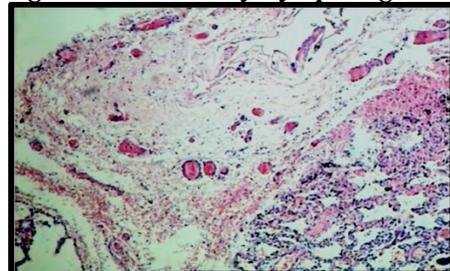
Congenital malformations of the lung and mediastinum are relatively rare and vary in their presentation and severity. Most of these lesions are cystic in nature, but some are solid and others may have both components. These bronchopulmonary anomalies are usually detected in the neonatal period or in early childhood. However, some are not encountered until later in childhood or in adulthood and some of them may even remain asymptomatic throughout life.⁸



Bronchopulmonary foregut malformation-Haphazardly arranged Bronchiole like structures

1 case of BPFM was studied. In our case a 10 day female presented with excessive drooling of saliva and breathlessness. On histology it was diagnosed as bronchopulmonary foregut malformation.

Congenital Pulmonary Lymphangiectasis



Congenital pulmonary lymphangiectasis-Subpleural dilated lymphatic channels

Congenital pulmonary lymphangiectasia (PL) is a rare developmental disorder involving the lung, and characterized by pulmonary

subpleural, interlobar, perivascular and peribronchial lymphatic dilatation. The prevalence is unknown. PL presents at birth with severe respiratory distress, tachypnea and cyanosis, with a very high mortality rate at or within a few hours of birth.⁹ one case of congenital pulmonary lymphangiectasis was studied.

Discussion

In study period of 8 years, total cases of respiratory tract lesion in pediatric age group were 152. Total autopsies conducted were 568. Out of these 103 were pediatric autopsies contributing to 18.13%. Neonatal autopsies were 14 contributing to 2.4%. Pediatric autopsies with lung pathology were found in 98 contributing to 95.10%. Out of these pediatric autopsies with primary lung pathology were 52 contributing to 53.1% and secondary lung pathology were 46 contributing to 30.27%.

Total number of cases in neonatal age group were 16 (10.50%), in infants were 16 (10.50%), in 1- 5 years age group 44 (29%) and in 5 years - 10 years age group 38 (25%), in 10 years – 15 years age group 25 (16.50%) and in 15 years - 18 year age group 13 (8.50%). Males affected were 86 contributing to 57% and total numbers of female affected were 66 contributing to 43%. The study showed male predominance.

Fever, cough and breathlessness were most common symptoms found in the present study. Majority of primary lung pathology were infective in etiology and were common in age group less than 5 years. Hence maximum mortality was in this age group. Bronchopneumonia was the commonest pathology observed contributing 25.46% of primary lung pathology. Complications of bronchopneumonia (empyema, lung abscess and pleural effusion) were seen in 16 cases.

Tuberculosis contributed 17 cases (16.03%) of primary lung pathology, showing different patterns like pulmonary tuberculosis, miliary tuberculosis and disseminated tuberculosis. Most common pathology in neonatal deaths was bronchopneumonia (56.25%), followed by hyaline membrane disease (26%).

Conclusion

Majority of the primary lung pathology was infective in etiology. The common age group affected was <5 years. Bronchopneumonia was the commonest pathology followed by tuberculosis.

Neonatal deaths form a major burden over health care system. Bronchopneumonia was again the most common pathology for neonatal deaths. Infective etiology also included superficial and invasive fungal infections like rhinosporidiosis, aspergillosis and Cryptococcus infection. Other inflammatory conditions like inflammatory nasal polyps constituted a minor component. Biopsy is needed in cases where the radiological findings are inconclusive, for etiological agent determination and also for diagnosing congenital anomalies. Autopsy study has also changed the approach towards managing respiratory lesions in infants and children. Hence with our study we conclude that children under the age of 5 years are vulnerable for bronchopneumonia and tuberculosis leading to increased mortality. Thus nutritional status, hygiene should be maintained and with early diagnosis and immediate treatment morbidity and mortality can be prevented.

Conflict of Interest: None declared

Source of Support: Nil

Ethical permission: Obtained

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