



HISTOPATHOLOGICAL SPECTRUM OF LUNG LESIONS IN AN AUTOPSY STUDY

Pathology

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ABSTRACT

In this retrospective and prospective study of 5 years duration, out of 230 clinical autopsies, total 228(99.13%) clinical autopsies were considered. Significant proportion of the deaths was noted in neonates (28.10%) of the total cases followed by infants (21.00%). Males (122 cases - 53.50%) outnumbered females (105 cases - 46.10%) in the ratio of 1.16:1. Various lung pathologies identified in 221 cases (96.90%) while 7 cases (3.10%) showed no specific pulmonary pathology. Amongst 228 clinical autopsies 342 lung lesions were encountered. Major bulk was formed by non-neoplastic lesions of the lung (98.83%) whereas neoplastic lesions were contributed only in 1.17% of the cases.

KEYWORDS

Clinical autopsies, lung pathologies, non-neoplastic and neoplastic.

INTRODUCTION:

'Mantui Vivas Docueran' means let the dead teach the living.^{1,2} Autopsy refers to self-study of a dead body carried out for medical, legal or scientific purpose.^{1,3}

Millions of people around the world are being affected by preventable chronic lung diseases.^{1,4,5-10} The risk factors for lung diseases include air pollution, environmental inhalant, toxic substances like arsenic, asbestos, nickel, chromium etc. and smoking.^{1,11,12,13,14,15}

Gross examination of lungs give information regarding status of lung, i.e. collapsed or hyper inflated, congestion, presence of firm to hard areas, tubercles and necrosis, fibrosis, bullae, consolidation, pigmentation, nodules, infarction, secretions, abscess formation which provide hint to the diagnosis. Different histopathological patterns in lung specimen were studied along with gross findings in consideration to know the cause of morbidity and mortality.^{9,12-16,17,18}

AIMS AND OBJECTIVES:

1. To determine the frequency of different histopathological pulmonary lesions of autopsy specimens.
2. To correlate histopathological findings with underlying diseases.

MATERIAL AND METHODS:

Source Of Data:

The present 5yrs retrospective and prospective study, was carried out in the department of Pathology in a tertiary care centre and included 230 cases of clinical autopsies, performed by Virchow's method, relevant clinical data was retrieved from case records. Legal consent was taken from relatives.

OBSERVATIONS AND RESULTS:

Of the 230 clinical autopsies, total 228 (99.13%) autopsies were included having lung specimens.

Age Distribution:

Notable proportion of the deaths was noted in neonates (28.10%) followed by infants (21.00%), 2-9 years of age (17.40%) and 10-19 years of age (10.10%). Least common deaths were seen in fourth decade of life (2.60%).

Gender Distribution:

Table no 1: Gender Wise Distribution Of Clinical Autopsies (n= 228)

Gender Wise Distribution	Number of cases	Percentage (%)
Male	122	53.51%
Female	105	46.05%
Mermaid	1	0.44%
Total	228	100%

Gross Findings Of Lung:

Table No. 2: Gross Findings In Lung In Total Clinical Autopsies (n=228)

Gross findings in lungs	Total	Percentage (%)
Heavy/ oedematous lungs	73	32.02%
Congestion/hemorrhages	35	15.35%
Consolidation	30	13.15%
Diffuse or focal grey-white areas	24	10.53%
Caseous necrosis	2	0.88%
Cavity formation	2	0.88%
Miliary tubercles	1	0.44%
Wedge shaped infarct	1	0.44%
Dilated bronchioles	1	0.44%
Unremarkable	59	25.87%
Total	228	100%

Distribution Of Lung Pathologies:

Table No.3: Distribution Of Lung Pathologies In Clinical Autopsies (n=342*)

Lung pathologies	No. of cases	Percentage (%)
Non-neoplastic lesions	338	98.83%
Neoplastic lesions	04	1.17%
Total	342	100%

*n=342 lung lesions in 228 clinical autopsies as many cases and multiple findings.

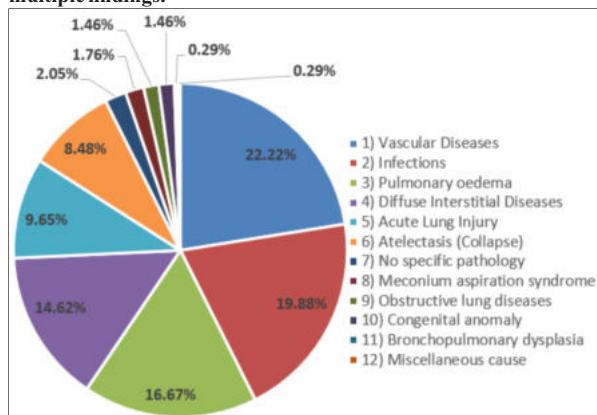


Chart No. 1: Distribution Of Non-neoplastic Lung Lesions In Clinical Autopsies (n=338)

DISCUSSION:

Age And Gender Distribution:

In our study neonatal deaths were common (28.10%). Flow of the patients in our institute is from nearby rural area having poorest, disadvantaged and traditionally marginalised communities,

vulnerable to neonatal mortality and morbidity.

Males (53.50%) were commonly affected than females (46.10%) which was comparable with study done by Abhijit Acharya et al²⁰ and Dr.Kurdukar et al² which showed 51.5% and 55.79% of male respectively.

Men are more vulnerable for exposure of risk as well as more addiction for smoking and alcoholism makes them prone for various diseases.²¹

Distribution Of Lung Pathology:

In present study, in 338 lesions showed non-neoplastic pathology (98.83%) and neoplastic lesion in 4 cases (1.17%) which was similar to Mangal K et al¹⁰, Dr. Kurdukar et al² and Sumaya et al²¹.

A. VASCULAR DISEASES OF LUNG:

Pulmonary Haemorrhage, Chronic Pulmonary Congestion, Pulmonary Embolism:

Present study revealed 10.2% cases of pulmonary haemorrhages in patients having sepsis, pneumonia, respiratory distress syndrome and trauma and comparable with study done by Sarita Dakhure et al¹¹ who got 12% cases.

Chronic pulmonary congestion were seen in 26 cases (7.6). This finding is consistent with study done by Shweta et al²² (6%), Dr.Kurdukar et al² (7.16%) and Shetty A et al^{11,23} (8.6%).

Pulmonary embolism in 9 cases (2.63%) was found and is comparable with the study of Anisha TS et al²⁴ (2%). One case had fat embolism and other 8 cases had thromboembolism.

B) Pneumonia:

Pneumonia was found in 58 cases (16.96%). The findings are comparable with study done by Smita Jhaveri et al²⁵ (17.5%).

In our study, frequency of cases of pneumonia is comparatively less attributing to early diagnosis, round o' clock monitoring, institutional antibiotic policy, positive compliance of patients to antibiotics and supportive treatment.

Tuberculosis Of Lung:

Four cases of tuberculosis of lung were noted (1.17%). This is in concordance with the study done by Theegarten et al²⁶, Pavic et al²⁷, Sangma et al²⁸ and Hanmante RD et al²⁹.

Gross findings were military tuberculosis, cavity formation and caseous type of necrotic areas.

Lung Abscess:

Three cases of lung abscess (0.88%) were encountered. This finding is in accordance with Abhijit Acharya et al²⁰ (1%) and Anisha TS et al²⁴ (1%).

Fungal Infections :

Three cases of fungal infections (0.88%), one case of mucormycosis (Fig.no.1), one case of aspergillosis (Fig.no.2) and one case of cryptococcosis were found during the present study.

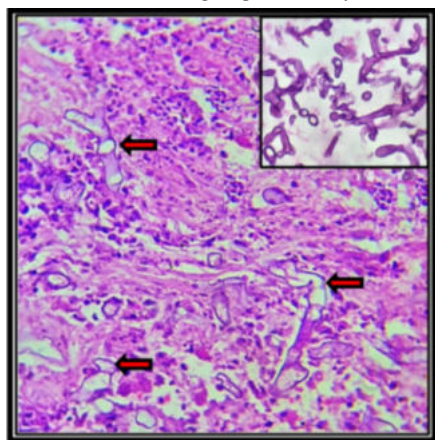


Fig.no. 1: Photomicrograph Of Pulmonary Mucormycosis (H& E, 40x). (PAS stain,40x)

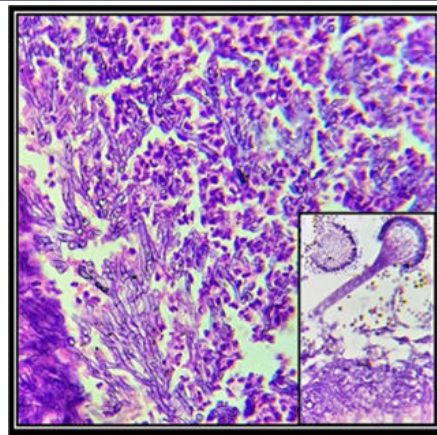


Fig.no. 2: Photomicrograph Of Pulmonary Aspergillosis Showing Elongated Slender Septate Hyphae With Acute Angle Branching. Inset Showing Fruiting Bodies (conidia) (PAS Stain,40x)

PULMONARY OEDEMA:

Pulmonary oedema was observed in 57 cases (16.67%). This is in accordance with Abhijit Acharya et al²⁰ (16%) and Sarita Dakhure et al¹¹ (19.8%).

DIFFUSE INTERSTITIAL (RESTRICTIVE) LUNG DISEASES:

Usual interstitial pneumonia is divided into idiopathic pulmonary fibrosis and cryptogenic fibrosing alveolitis by American Thoracic society and European Respiratory society in the year 2002.^{30,31}

Present study comprised of 39 cases of non-specific interstitial pneumonia (11.40%), correlated with Sarita Dakhure et al¹¹ who found 14.6% cases of interstitial pneumonia.

USUAL INTERSTITIAL PNEUMONIA:

Usual interstitial pneumonia (UIP) were encountered in 8 cases (2.32%), amongst which 7 cases were idiopathic pulmonary fibrosis (IPF) (Fig.no. 3) and single case of cryptogenic fibrosing alveolitis (CFA).

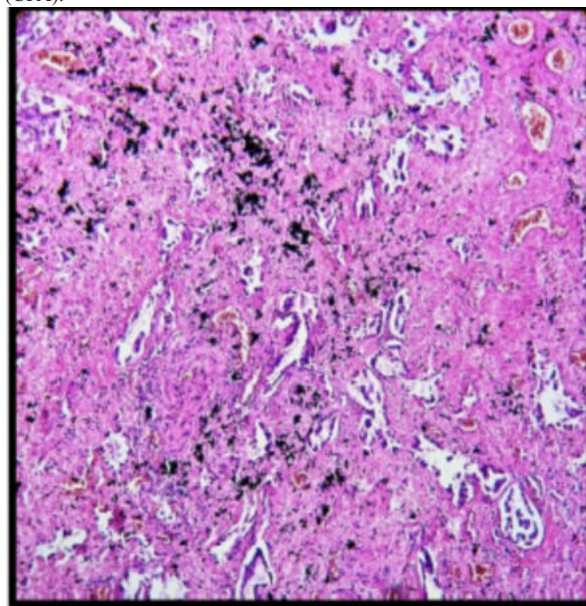


Fig.no. 3: Photomicrograph Of Idiopathic Pulmonary Fibrosis (H& E, 10x)

GIANT CELL INTERSTITIAL PNEUMONIA (GIP):

An unusual case of giant cell pneumonia (0.29%) was enlightened in 2 years female child. Giant cell pneumonia (Hecht's giant cell pneumonia), is an interstitial pneumonitis showing multinuclear giant cells observed only in children and associated with viral infections such as measles, respiratory syncytial virus, adenovirus etc³⁰ (Fig.no. 4).

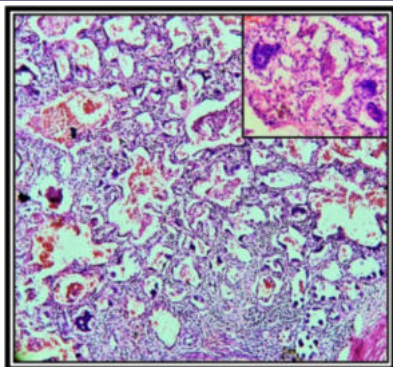


Fig.no. 4: Photomicrograph Of Giant Cell Interstitial (inset, H&E, 40x and H&E, 10x)s

ACUTE LUNG INJURY (ALI):

Acute respiratory distress syndrome (ARDS) and hyaline membrane disease (HMD) is a manifestation of severe ALI.¹⁷ In present study, 33 cases (9.65%) of acute lung injury were observed. Neonates predominate with history of asphyxia and succumbed to it. Adult patient presented with sepsis, pneumonia and trauma. Twenty-seven (7.89%) cases reported as hyaline membrane disease and ARDS found in 6 cases (1.76%). Correlating with study done by Udayshankar et al³² (9.09%).

ATELECTASIS:

Twenty nine cases of atelectasis (8.48%) were found and comparable with Pulak Chakma et al¹⁸ who noted atelectasis in 23 out of 426 cases (5.39%).

MECONIUM ASPIRATION SYNDROME :

It was noticed in 6 newborns retrieved with history of prolonged labour (1.76%) and comparable with Pratima Khare et al³³ (1.78%).

OBSTRUCTIVE LUNG DISEASES :

Chronic bronchitis is defined clinically as persistent cough with sputum production for atleast 3 months in atleast 2 consecutive years, in absence of any other identifiable cause.

Three cases of chronic bronchitis (0.88%). One case of emphysematous change was found and correlated with study of Bhavneet Kour et al.³⁴

PULMONARY HYPOPLASIA:

Lung hypoplasia is best considered when lung:body weight ratio is less than 0.012 and usually associated with other malformations like diaphragmatic hernias, severe musculoskeletal disorders, renal anomalies etc³⁰.

Amongst 5 cases, 3 neonates with pulmonary hypoplasia were associated with prematurity with oligohydramnios, single case of mermaid syndrome and congenital diaphragmatic hernia. Wigglesworth et al³⁵ also reported that lung which are hypoplastic as a result of oligohydramnios.

Single case of bronchopulmonary dysplasia was observed in 5 month old male child having history of sepsis (0.29%).

NEOPLASTIC LESIONS OF LUNG:

Four (1.17%) cases of metastatic malignant neoplasms of lung were identified. One case was metastatic mediastinal neuroblastoma (5 years female child), another was metastatic hepatocellular carcinoma (66 years male) and 2 cases were of infiltration by leukaemia (10 years male and 43 years female).

Findings of present study are well correlated with study done by Puneet Garg et al¹ and Bhavleen Kaur et al¹⁶ which showed 1% and 1% malignant lesions respectively.

CAUSES OF DEATH:

Among 228 cases, respiratory diseases alone contributed as a cause of death in 50% of the cases which included pneumonia, respiratory distress syndrome, pulmonary oedema, pulmonary haemorrhages, meconium aspiration syndrome, atelectasis, pulmonary

thromboembolism, lung abscess, bronchitis and bronchopulmonary dysplasia.

CONCLUSION:

In our study, notable proportion of the deaths was noted in neonates followed by infants. Fetal and neonatal autopsies give the information regarding recurrence risk of fetal anomaly, so that regular antenatal check-up with specific diagnostic test help to avoid congenital anomalies in subsequent newborn.

Pneumonia was the predominant finding which suggest infectious diseases are still remaining to be the common cause of mortality. Public awareness of these diseases, timely diagnosis and proper treatment are valuable for reducing preventable causes of death.

The autopsy study with histomorphology has endured as a vital complimentary tool for recognising and understanding chronic respiratory diseases. It also serves as educative tool in identifying and establishing the underlying cause of death and is of great value in refining the vision and diagnostic setup for better clinical evaluation and provide opportunity to discover new disease.

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