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ORIGINAL ARTICLE

Histopathological Spectrum of Pulmonary Lesions in Autopsies- A Two Year Retrospective Study

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ABSTRACT

Introduction:

Background: The lungs are secondarily involved in almost all forms of terminal events. Study of these lesions will help in devising prophylactic strategies to reduce associated mortality.

Objectives: To find the frequency of various lung lesions in relation to age, sex, and to analyze histopathological spectrum of lung lesions in autopsy cases.

Material and methods: Two-year retrospective study based on hospital records from January 2019 - December 2020 carried out in department of pathology. Lungs were fixed in 10% formalin & processed. Paraffin wax embedding was done & sections stained with H&E stain. Gross and microscopic examination of samples were conducted for diagnosis.

Results: A total of 147 cases with lung specimens were received during the period of study. Among these, 47 (32%) cases showed tissue autolysis of lung. The age ranged from 8 months to 80 years. Majority of cases analyzed were from adults, only 8 (5.5%) cases were below 15 years of age. Pathologies were detected in 99 cases and one case had unremarkable histology. Majority of the cases (77%) were males. Microscopic findings seen included congestion and edema (30%), inflammation (acute pneumonia, granulomatous and fungal) (23%), emphysema (20%), changes in interstitium (12%) and pulmonary thromboembolism (12%). Majority of the pulmonary thromboembolism were seen in the age group of 16-30 years.

Conclusion: Congestion and edema followed by pneumonia were the most commonly observed pathological lung lesions in our study. Autopsy study of lung lesions can provide an insight to plan certain preventive strategies to reduce morbidity and mortality due to lung pathology.

keywords |Autopsy; Histopathology; Lung lesions

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INTRODUCTION

The term "autopsy" refers to a self-examination of a deceased person. It is a crucial method for detecting the state of internal organs as well as analyzing sickness

or injury that could explain the reason and manner of death. All three cavities of the body, including the cranium, thorax, and abdomen, must be examined during an autopsy. The most significant aspect of both medicolegal and clinical autopsies in the thorax is the lung examination. Clinical or pathological autopsies are frequently performed by pathologists to ascertain the cause of death and to investigate the body.[1]

Various infectious, occupational, and neoplastic disorders impact the lungs.Gross pathologic examination of autopsy lungs reveals information about the status of the lung, whether it is collapsed or hyperinflated, the presence of scarring, fibrosis, bullae, consolidation, nodules, infarction, secretions, Edema, congestion, granuloma/abscess formation, and the status of the bronchi and pleura, which may provide a clue to the diagnosis.[2]

This study describes the frequency of various lung lesion in relation to age and sex and analyses histopathological spectrum of lung lesions in autopsy cases.

MATERIALS AND METHODS

This is a retrospective study done in the department of pathology in a tertiary care hospital in Bangalore for a period of two years (January 2019 to December 2020). The study was conducted on lung specimens of 147 autopsies where the specimen of lung was sent for pathological examination. Patient information regarding age, sex, brief history of illness and in situ postmortem findings were obtained from the request form.

All specimens were adequately fixed in 10% formalin. Gross examination of lungs included size, weight, color, consistency and presence of any pathological findings were noted and sections from representative areas were taken. After processing and paraffin embedding, sections were cut and stained with Hematoxylin and eosin (H&E) stain according to standard procedure. All the histological sections were examined microscopically, and findings were noted.[1]

All cases of lung specimens were included in study irrespective of age, sex and cause of death. However, we excluded autolyzed lung specimens from the study.

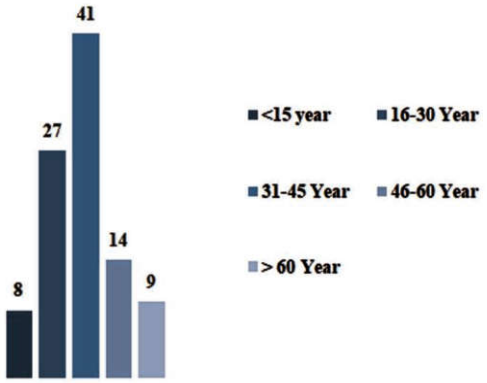
A Microsoft Excel 2019 software program was used to enter all data and analyse descriptive data.

RESULTS

A total of 147 specimens were received during the period of study along with relevant clinical details and autopsy findings. Among these in 47cases (40%) the tissue was autolyzed and in one specimen the histopathology was unremarkable.

Significant microscopic findings were found in 99 cases. Among the pathological lung specimens 77 were males and 22 females. The age ranged from 8 month to 80 years. Eight specimens belonged to individuals aged below 15 years. Majority of the lung samples (41 specimens) came from autopsies conducted on adults between 31 and 45 years. There were only 9 specimens belonging to people over 60 years age where autopsies were carried out. (Table 1)

Table 1: Age wise distribution of cases



Age wise distribution of cases

Wide varieties of microscopic findings were seen in lungs which included congestion and edema, inflammation (acute pneumonia, granulomatousand fungal), changes in interstitium, emphysema, and pulmonary thromboembolism. There were two cases of lung malignancies one each of primary (Adenocarcinoma of lung) (Fig. 1) and

metastatic disease. (Table 2).

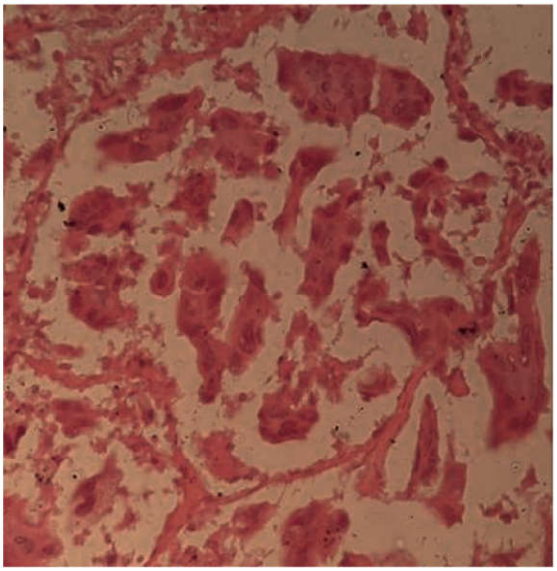


Fig. 1: Adenocarcinoma of lung (H &E 40x)

The most common pathology was congestion and edema, seen in 25 males and 5 females. The second most common pathology was inflammatory change, seen in 19 males and 4 females, of which 21 had finding of acute pneumonia (Fig.2) and one case each of granulomatous inflammation (Fig.3) and fungal (Cryptococcus) (Fig.4).

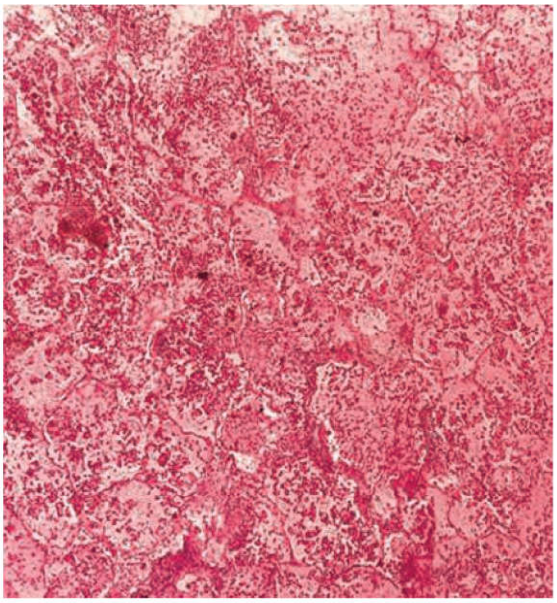


Fig. 2: Lobar pneumonia (H &E 10x)

Table 2: Distribution of cases based on histopathological diagnosis

Lung Lesions/ histopathological diagnosis	Total Cases	Malen (%)	Femalen (%)
Congestion and edema	30	25 (83%)	5 (16%)
Inflammatory changes	23	19 (82%)	4 (17%)
Emphysematous changes	20	18 (90%)	2 (10%)
Lung malignancy	2	0 (0%)	2 (100%)
Changes in the interstitum	12	8 (66%)	4 (33%)
Pulmonary thromboembolism	12	7 (58%)	5 41%)
Total	99	77 (77%)	22 (22%)

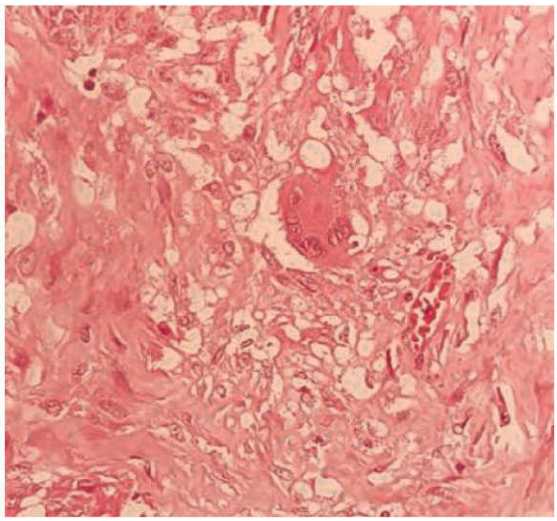


Fig. 3: Granulomatous inflammation (H & E 40x)

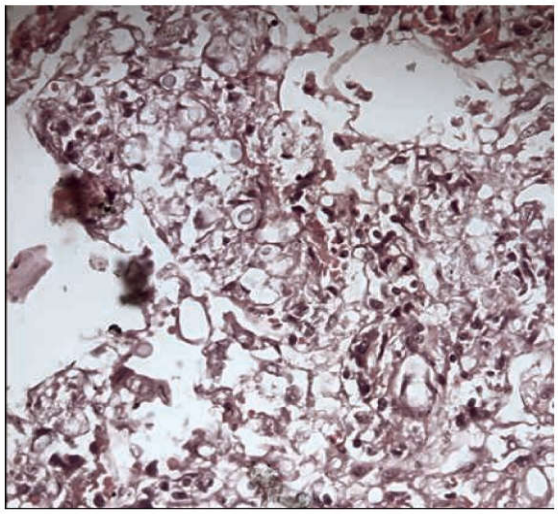


Fig. 4: Cryptococcal infection (H & E 20x)

Among the 20 cases with emphysematous changes, 18 were males, and 2 were females. Twelve specimens had interstitial changes and pulmonary thromboembolism, most of which were males in the age group of 16-30 years.

DISCUSSION

Medicolegal autopsies are a mandatory legal requirement in unnatural deaths and are done to assist the legal and criminal evaluation procedures. Autopsies, when combined with relevant details and histopathological examination, are extremely useful in determining the causes of death.[1]

Many of the findings in our study were comparable with other similar studies done across India. Majority of the specimens in our study were from males and a similar pattern was also observed in studies conducted in different parts of India.[1-3]

Congestion & oedema was the most common histopathological finding similar to the study done by KhareP et alin which 86 autopsy lung specimens were evaluated over a period of one and half year from a tertiary care hospital. Higher occurrence of congestion &oedema in our study could be due to secondary involvement of lungs in all forms of terminal events with cardiovascular causes.

The second commonest finding in the present study was acute pneumonia accounting to 21 cases (21%) which was comparable to the study done by TS Anisha et al which is in a similar setting as our study in a close by geographical location with total number of acute pneumonia cases being 15%.[3] However, the study done by Goswami et al in northwestern part of India had a much higher number of pneumonia specimens (33.8%) recorded over a similar study period.

In our study, emphysema cases were 20% which was comparable to Gowsami et al, whereas studies done by KhareP et al and TS Anisha et al the incidence of cases of emphysema were fewer.[1-3] Similar to all other studies majority of emphysematous specimens collected were from males, this could be due to the higher prevalence of smoking seen among men.[4]

In our study, two cases were found to have malignancy (one each of primary and secondary). Patel et al in his study spanning autopsies from six years also had about 2% specimens with unsuspected neoplasia. In general, unsuspected malignancies are a very un-common finding with a similar low percentage seen in other studies as well.[2] Ten-year retrospective analysis of 474 specimens in a tertiary care center in central India revealed no specimens with malignancy.[6]

Fungal colonies were seen in one specimen in our study, they were variably sized, round to oval encapsulated with thin cell walls suggestive of cryptococcus. A study conducted by KhareP et al found 1 case of broad non septate hyphae form which was an incidental finding in their study.[1]

Our study had a few limitations, lack of complete and detailed clinical history did hamper the diagnosis and cause of death determination. Alongside for the lung specimens that were collected in the time overlapping the COVID first wave, we did not have any test done to confirm the COVID-19 status of the cases, this may or may not have influenced our outcome.

CONCLUSION

In our study, the most common lung lesions contributing directly or indirectly to the cause of death were pulmonary edema and/or congestion. Pneumonia was the second most common pathological lung lesion observed in our study, implying that lung infections are a common cause of death. As a result, we believe that effective implementation of measures to prevent hospital acquired pneumonia may reduce mortality. Autopsies have remained a valuable complementary tool for identifying and understanding respiratory diseases. It also serves as a reassuring and educational tool in determining and establishing the cause of death.

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