

Histopathological Spectrum of Lung Lesions in Autopsy.

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Abstract

Background: Lungs are most commonly affected organs worldwide and show varied pathologies like infections and inflammation to neoplasia. Autopsy finds out the cause and manner of death.

Objective: The objective of this study was to study the histopathological spectrum of lung lesions in autopsy.

Methods: It is a retrospective study done on 32 cases received in the department of pathology, Siddhartha medical college, Vijayawada. Lung tissue bits those received were fixed in 10% formalin and processed, paraffin embedded and stained with Haematoxylin and Eosin staining, special stains were used as needed. Histopathological examination was done and findings were recorded.

Results: Histopathological examination of 32 cases was done, of them, 29(82.9%) showed pathology, 6(17.1%) were normal. Most commonly affected age group was 30 to 45 yrs, males being prominently affected. Congestion and edema was observed in 10(34.4%), inflammatory 9(31.03%), Interstitial changes 2(6.8%), Emphysematous changes 3(10.3%), ARDS 3(10.3%), HMD 1(3.4%), MAS 1(3.4%) respectively.

Conclusion: Congestion and edema is the most common pathological change observed in the present study. Lung lesions are more common in males as compared to females and there is a strong association of smoking with emphysema.

Key words: Lung lesions, Autopsy, Emphysema.

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I. Introduction

Lungs are the most commonly affected organs worldwide and presentation of lung pathology is varied and complex. Diagnosis is often challenging for clinicians despite the availability of modern advanced diagnostic methods. Hundreds of millions of people around the world suffer from preventable chronic respiratory diseases.^[1] A large number of conditions involve the parenchyma of the lung which may be associated with inflammation, fibrosis or granulomatous reactions.^[2] Clinical and radiological findings in the pulmonary diseases are non specific and prompt pathological investigations and diagnoses are essential to improve patient's survival, to avoid rapid progression of disease and to spare patient from more invasive procedures.^[3] Rapid progression leaves lesser time for thorough diagnostic and invasive procedures.

Early histopathological features of well documented disorders of lung still remain a mystery as these are not easily subjected to biopsy. Hence histopathological examination of lung autopsy is of great value to diagnose respiratory cause of death. It also augments our knowledge about lung pathology. Determining the cause of death is an obvious objective of medico legal autopsy.^[4] In addition to ascertain clinicopathological differences, autopsy has a role in the development of new understanding of old diseases and facilitates the opportunity to uncover the pathophysiology of new diseases.^[5]

II. Materials And Methods

This study was done in the department of pathology, Siddhartha medical college Vijayawada, attached to Government General Hospital – Tertiary Care Hospital. Study was conducted over a period of three years from January 2016 to December 2018. All consecutive cases that underwent medico legal autopsy had been submitted to Histopathological examination from the forensic department irrespective of age, sex during the above mentioned period were included in the study. Samples which were autolysed, those without lung tissue and those without proper gross findings were excluded from the study.

Lung tissue bits were received in 10% formalin from the department of Forensic medicine along with history, clinical details and gross findings. The lungs were weighed, measured. Grossly lungs were examined for color, consistency, volume, presence of scarring, fibrosis, bullae, consolidation, infraction, nodules, edema,

secretions, abscess formation or granuloma. The status of pleura and bronchi are recorded. Gross examination was co – related with the clinical findings as mentioned in the requisition. 4-5mm samples were taken from the representative areas of the specimen in cassettes and after routine processing, paraffin embedding, blocks were prepared. All the sections were stained with Haematoxylin and Eosin stain and are mounted. PAS(Periodic Acid Schiff) and ZN(Zeihl-Neelson) stain were performed wherever required. They were examined microscopically and findings were recorded.

III. Results

During a period from January 2016 to December 2018, a total of 32 specimens of lungs received at autopsy section of Histopathology Department at a tertiary care hospital in Vijayawada were studied. Age wise distributions of these autopsy cases are shown in (Table 1). Among 35 cases, pathology was seen in 29(82.8%) cases and 6(17.1%) cases showed normal lung tissue.

Table 1: Status of lung tissue on histopathology (n=35)

Parameter	New born- 15 yrs	16-30yrs	31-45 yrs	46-60 yrs	>60 yrs	Total(%)
Normal lung	1	2	1	2	----	6(17.1%)
Diseased lung	3	9	7	5	5	29(82.8%)
Total cases	04	11	08	07	05	35(100%)

A Wide variety of lesions were seen in lungs which included edema and congestion, inflammation (acute, granulomatous and fungal), changes in interstitium, emphysema and Acute Respiratory Distress Syndrome (ARDS)(Table 2).

Table 2: Age-wise distribution of lung lesions (n=29)

Lesion	Newborn- 15 yrs	16-30 yrs	31-45 yrs	46-60yrs	>60 yrs	Total 29(100%)
Congestion and edema	2	1	4	3	----	10(34.4%)
Inflammatory	1	2	2	2	2	9(31.03%)
Interstitial changes	----	1	1	----	----	2(6.8%)
Emphysematous changes	-----	----	2	1	----	3(10.3%)
ARDS	----	3	----	----	----	3(10.3%)
HMD	1	----	----	----	----	1(3.4%)
MAS	1	----	----	----	----	1(3.4%)

Table 3 shows the sex wise distribution of lung lesions. Out of the 29 cases of diseased lungs, 17(58.6%) were males and 12 (41.3%) were females.

Table 3: Sex wise distribution of lung lesions.(n=29)

Lesion	Newborn- 15 yrs	16-30yrs	31-45yrs	46-60yrs	>60yrs	Total 29(100%)
Congestion and edema	2	1	4	3	----	10(34.4%)
Inflammatory	1	2	2	2	2	9(31.03%)
Interstitial changes	----	1	1	----	----	2(6.8%)
Emphysematous changes	----	----	2	1	----	3(10.3%)
ARDS	----	3	----	----	----	3(10.3%)
HMD	1	----	----	----	----	1(3.4%)
MAS	1	----	----	----	----	1(3.4%)

Congestion and edema were the commonest pathology seen in 5 males and 4 females. These cases showed congested blood vessels and intra-alveolar haemorrhages, alveoli distended with protein rich fluid. (Fig 1) .The second commonest pathology was inflammatory lesions which includes cases of acute pneumonia and granulomatous inflammation. Acute pneumonia was seen in two cases characterized by vascular engorgement, intra-alveolar fluid and neutrophilic infiltrate. Granulomatous inflammation [Fig-2] was also seen in four males and three females. Out of these seven cases three cases were ZN stain positive showing presence of Acid Fast Bacilli (AFB). Caseous necrosis was present in all these seven cases and these were diagnosed to be suffering from pulmonary tuberculosis. Changes in interstitium seen in two male cases. There was broadening of inter-alveolar septae and mononuclear infiltrate, interstitial fibrosis and increased alveolar macrophages in these cases. Emphysematous changes (Fig 3) were seen in 3 cases, in which 2 were male and one was female. ARDS was seen in one male and two female cases which showed congestion, intra-alveolar oedema, inflammation,

fibrin deposition. HMD and MAS were seen in one male case each. One case of hyaline membrane disease was seen in which section showed alveoli lined by eosinophilic hyaline membrane (Fig 4). One case was of meconium aspiration syndrome which showed few squames within the alveoli.

Figure 1: Shows congestion and edema of lung parenchyma.

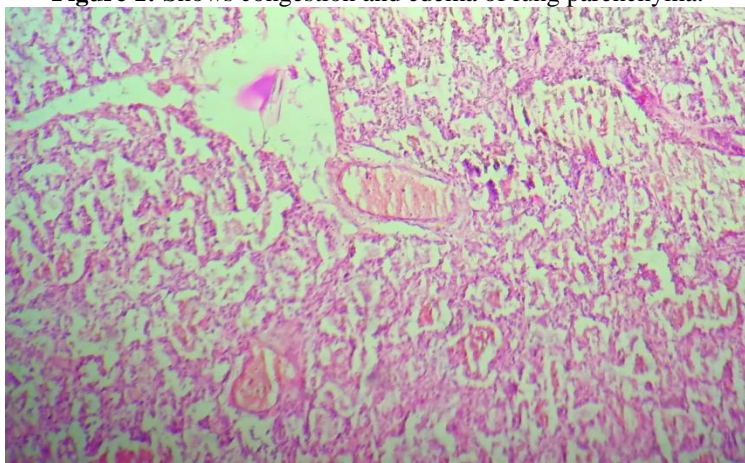


Figure 2: Shows Granulomatous inflammation in lung.

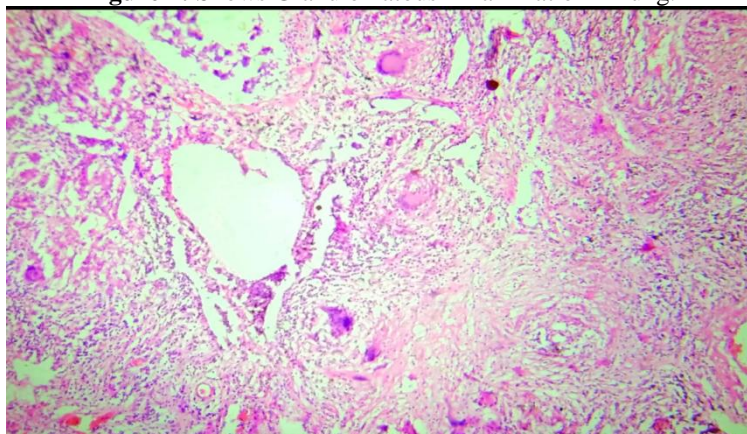


Figure 3: Shows Emphysematous changes

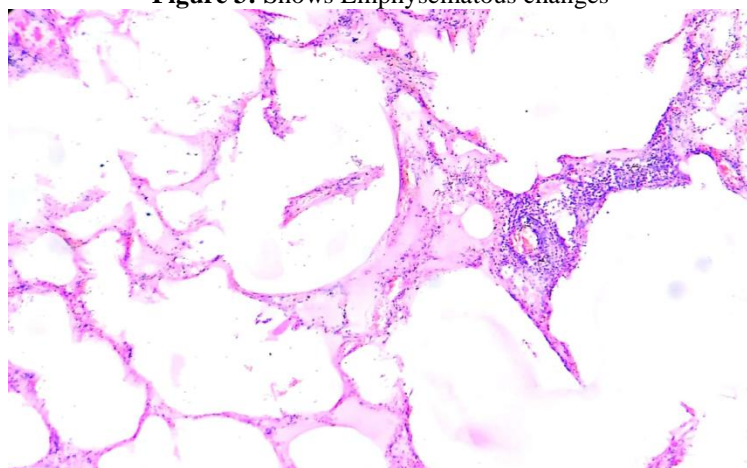
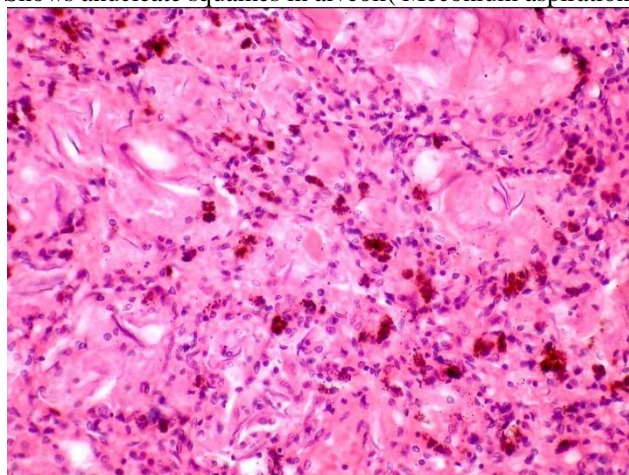


Figure 4: Shows anucleate squames in alveoli (Meconium aspiration syndrome)



IV. Discussion

In our study, congestion and oedema was the commonest finding and was seen in 10 cases. This was 34.4% of the total lung cases with pathological changes. Similar observations were also observed by many authors in their series.^[6,7] This could be a death related change or secondary involvement of lungs in all forms of terminal events due to cardiovascular causes.

In the present study, 7 cases of granulomatous diseases were noted which accounted for 20 % of the total cases. This was in concordance with the study done by Tariq et al (2015) and Udayshankar^(8,9) et al. Among which 2 cases (28.5%) are of miliary tuberculosis involving lung, liver, kidney, and spleen. Granulomatous lesions are more common in males than females. In our study, 4 male cases (57.1%) and 3 female cases (42.8%) have granulomatous lesions (Figure 2). These findings are comparable to Hjortn et al study and similar results also found in Sanefugi et al study, in which 19% of cases are of miliary tuberculosis among all tuberculosis cases.^(10,11)

Two cases of acute pneumonia(5.7%) were seen in the present study. Pratima khare et al⁽¹²⁾ reported (8.7%) cases of acute pneumonia which corresponds to our findings. The result showed that there are 3 (8.5%) cases of emphysema out of 35 cases. Emphysema (Figure 3) affected 2(5.1%) males and 1 (1.5%) female, among which 66.6% of the cases were associated with smoking. Similarly, Niazi in her Morphological study of pulmonary embolism in autopsy cases found significantly greater numbers (77.5%) of emphysema cases in smokers⁽¹³⁾

We had 3 cases (10.3%) of emphysema in our series of 35 cases. Among those two males, one female were in age group of 30-60 years. All of these cases had urban background. Selvam V et al., reported 54 cases (50%) of emphysematous changes in the lungs in their series of 108 cases.^[6] Their study had 61.1% and 38.9% cases with urban and rural background respectively.

Only one autopsy sample showed features of ARDS in our series of 35 cases (2.8%). Retrospective study conducted by Sachdev S et al., 125 lung autopsy cases over a period of three years, also observed low prevalence of acute respiratory distress syndrome (3.15%).^[14] One case each of hyaline membrane disease and meconium aspiration syndrome was seen in our series. The hyaline membrane disease was seen in a preterm male baby having gestational age of six months and 28 days. Meconium aspiration syndrome was seen in a newborn male with term gestation. Thomas S et al., in their prospective study on spectrum of respiratory distress in 1400 consecutive new-borns in North Indian population found that 116 cases developed respiratory distress.^[15] Among these 116 cases, there were 10 cases of hyaline membrane disease and 14 cases of meconium aspiration syndrome. Interstitial changes were seen in 2(6.8%) of cases. Such changes could be due to pollution, smoking or any restrictive lung disease leading to fibrosis.

V. Conclusion

The present study documents the histomorphological spectrum of lung lesions seen in autopsies received in a tertiary care hospital in Vijayawada. Congestion and edema is the most common pathological change observed in this study. Lung lesions are more common in males as compared to females. There is a strong association of smoking with emphysema which indicates that there is some influence of environmental factors in their pathogenesis.

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