



## SPECTRUM OF PULMONARY LESIONS IN AUTOPSY OF LUNG AT TERTIARY CARE CENTRE: A CROSS-SECTIONAL STUDY

### Pathology

<b>Dr Jyoti Poonia</b>	MD, Department of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar (Haryana).
<b>Dr Pravin</b>	Professor, Department of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar (Haryana).
<b>Dr Aditi Baghla</b>	Professor & HOD, Department of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar (Haryana).
<b>Dr Karandeep Singh</b>	Professor, Department of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar (Haryana).
<b>Dr Anu</b>	SR, Department of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar (Haryana).
<b>Dr Manisha</b>	MD, Department of Pathology, Maharaja Agrasen Medical College, Agroha, Hisar (Haryana).

### ABSTRACT

**Introduction:** The incidence of lung pathology is the most common autopsy finding and is responsible for a great deal of mortality and morbidity. The lungs are affected by various infectious, inflammatory, occupational and neoplastic conditions. Lungs are involved secondarily in almost all the terminal events. Radiological findings are usually nonspecific in lung diseases and need prompt histopathological examination to find out the exact cause of death. **Objective:** To study Spectrum of Pulmonary Lesions in Autopsies at Tertiary Health Care Centre **Materials and Methods:** This is prospective study done in the Department of Pathology at Maharaja Agrasen Medical College, Agroha, Hisar, Haryana over a period of 12 months. Gross findings of received specimen were noted. Formalin fixed specimens were processed and paraffin sectioning was done followed by hematoxylin and eosin staining. **Result:** Among 120 cases studied during year maximum cases were seen in the age group of 31–60 years (74%). Males (90%) were more commonly affected than females (10%). The most common findings are Pulmonary congestion (35%) followed by edema (29%) and other findings include emphysematous change (7%), pneumonia (12%), tuberculosis (13%), metastatic deposits (1%). **Discussion:** In our study, male preponderance was noted similar to study done by Dhruw et al (73%) and Gupta et al (84%). Pulmonary edema was most common finding done by Parkasam et al (34%). **Conclusion:** The most common finding observed was pulmonary congestion. Male were most commonly affected. As there is rapid increase in respiratory morbidity and mortality due to increase in air pollution and smoking, autopsy gives an insight into the histopathology of various diseases.

### KEYWORDS

#### INTRODUCTION

Autopsy as a word means self - study of dead body. It is an important way to find out the condition of internal organs, to evaluate disease or injury that could explain the cause and manner of person's death. Examination of all the three cavities of body including cranium, thorax and abdomen are an essential part of autopsies. In thorax, lungs examination is the most important part of both the medicolegal as well as clinical autopsies.<sup>1,2</sup>

Average adult right lung weighs- 450gm (375-450gm); left lung weighs-400gm (325-450gm).

The two main components of the lung parenchyma are the bronchi and bronchioles (airways) and the alveoli.<sup>2</sup>

#### In Lung Autopsy –

The lungs are examined for disease, injury and other findings suggesting cause of death or related changes.<sup>3</sup>

The lungs are affected by various infectious, inflammatory, occupational and neoplastic conditions. Lungs are involved secondarily in almost all the terminal events. Lung disorders have varied and complex presentations. As a result, despite availability of modern advanced diagnostic methods, diagnosis is often challenging task for clinicians.<sup>2</sup>

There has been a rapid increase in respiratory morbidity in the current population due to increase in air pollution, smoking, and chemical substances that lead to preventable chronic respiratory diseases affecting millions of people all over the world.<sup>5</sup>

Pathological examination of lung specimen gives valuable information such as lung collapse or hyperinflation, stage and distribution of fibrosis, abscess, bullae, consolidation, infarction, congestion/edema, granuloma/necrosis, nodular lesions, status of

bronchi, hilar nodes and pleura which may provide hint to the diagnosis.<sup>6</sup>

In this study Histopathological examination of autopsy samples of the lungs has been presented. This study describes the prevalence and pattern of lung diseases in medicolegal autopsies, confirmed by histopathological examination.

The aim of this study was to emphasize and study the histopathological alteration in lungs in autopsies of patients with varied causes of death.

#### METHODOLOGY

This study was carried out in the Department of Pathology at Maharaja Agrasen Medical College, Agroha, Hisar, Haryana over a period of 12 months. The study was conducted on lung specimens of routine autopsies.

Medicolegal autopsy specimens in this period were taken irrespective of age, gender and followed by HPE to identify the cause of death.

These specimens were received in 10% formalin and studied grossly. In all the cases, available clinical details (age, gender and clinical diagnosis) were collected and details regarding the gross findings of the lung specimens, including the type of specimen, size and weight were noted. The characteristics of the lesions seen grossly were noted in terms of size, site, consistency and distribution were noted.

Later sections from the lung tissues were taken and after routine processing and paraffin embedding, blocks were prepared. Slides for HPE were prepared by taking serial sections of the prepared blocks and stained by hematoxylin and eosin stain. Special stains like AFB, PAS were used whenever required. Digital records were used for further evaluation.

#### RESULT

The study population was evaluated for age, gender, cause of death, gross features and microscopic findings.

Total 120 cases of pulmonary lesions were studied. It included patients of age ranging from 08 months to 72 years of age and age group of 41 to 50 (30%) was most commonly involved, followed by 21 to 30 (22.5%) and 21-30 years age group. Least common age group involved was 0 to 9 year (1.7%) followed by 11-20 age group (3.3%) (Table no.1)

Out of 120 cases studied male were most commonly involved 106 (88.3%) than female 14 (11.7%). (Table no.2)

Out of 120 cases studied a wide spectrum of non- neoplastic lesions seen including pulmonary congestion 29 (24.2 %), as most common microscopic finding followed by edema 26 (21.7%). Infective lesions as pneumonia (14.2%), tuberculosis (13.3%), bronchitis (5.0%), mucormycosis (0.8%), actinomycoses (2.5%) granulomatous lesions (5.0%) and emphysema (5.0%). Carbon pigmentation (2.5%) and chronic venous congestion (4.2%) seen. Out of 120 cases, one case of metastatic deposit (0.8%) seen. (Table no.3)

**Table No. 1: Number Of Cases According To Age Group**

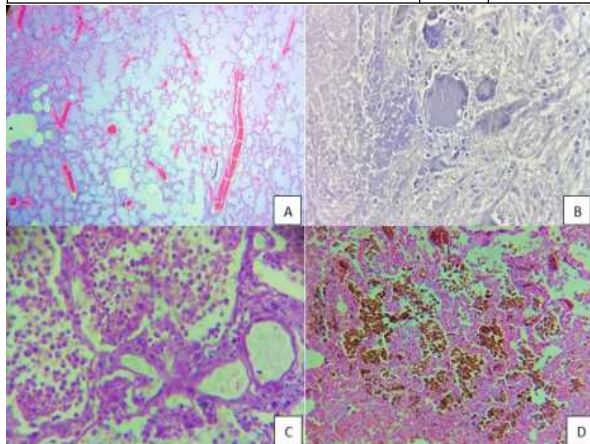
Distribution Of Cases According To Age Group	No. Of Cases	Valid Percent
<10	2	1.7
11-20	4	3.3
21-30	27	22.5
31-40	21	17.5
41-50	36	30
51-60	19	15.8
>60	11	9.2
Total	120	100

**Table No. 2: Number Of Cases According To Gender Sex**

Number Of Cases According To Gender Sex	No. Of Cases	Valid Percent
Female	14	11.7
Male	106	88.3
Total	120	100

**Table No. 3: Number Of Cases With Microscopic Features**

Number Of Cases With Microscopic Features Histology	No. Of Cases	Percentage
Actinomycosis	3	2.5
Bronchitis	6	5
Carbon pigmentation	3	2.5
Carcinoma	1	0.8
Chronic venous congestion	5	4.2
Congestion	29	24.2
Edema	26	21.7
Emphysema	6	5
Granulomatous lesions	6	5
Mucormycosis	1	0.8
No specific	1	0.8
Pneumonia	17	14.2
Tuberculosis	16	13.3
Total	120	100



Figure(400X) A) Shows congestion and edema B) Shows Langhans

giant cells and positive for AFB. C) Shows diffuse collection of polymorphs in alveolar spaces. D) Shows hemosiderin laden macrophages.

**DISCUSSION**

The present study emphasises on spectrum of histopathological findings in lung autopsies revealing a diverse range of diagnoses including infective diseases that is pneumonia, tuberculosis, bronchitis, mucormycosis, emphysema and granulomatous lesions. These findings are in concordance with other previous conducted studies.

Out of 120 cases ,106 Males (88.3%) and 14 (11.7%) females were taken, with male to female ratio of 4:1. These findings are in concordance with Hanmante RD et al<sup>9</sup>, Bhavleen Kaur et al<sup>7</sup>, Sumaya et al<sup>8</sup> and Anisha et al. as shown in table no. 4

In present study non neoplastic lesions outweigh the neoplastic lesions with 94.17% and 0.83% respectively and these finding were in concordance with studies done by other authors as shown in table no. 5 Most common histopathological finding was pulmonary congestion (24.2%). These findings were significant showing wide variation of histopathological lesions in different age group. Third common finding was Pneumonia (14.2%) similar to study done by Prakasam et al (10.0%) with most common finding of pulmonary congestion followed by pulmonary oedema. In studies done by Sumaya et al<sup>8</sup> (15.65%) Anisha et al (64%) and Hanmante et al<sup>7</sup> (26%), most common finding was pulmonary oedema. (table no. 6)

**Table No. 4 Comparison Of Sex Distribution**

Serial no	Studies	M:F
1	Hanmante RD etal, nanded <sup>9</sup>	4 :1
2	Bhavleen Kaur et al , Patiala <sup>7</sup>	3 :1
3	Sumaya et al, Karnataka <sup>8</sup>	3.4 :1
4	Anisha et al , Banglore <sup>3</sup>	4.2 :1
5	Present study	4 :1

**Table No. 5 Comparison Of Distribution Of Lesions With Various Other Studies**

Serial no	Studies	Non neoplastic	Neoplastic
1	Chauhan G et al <sup>10</sup>	82.9 %	2.08%
2	Mangal K et al <sup>11</sup>	90 %	0.41 %
3	Sumaya et al <sup>8</sup>	92.2%	0.87%
4	Present study	94.17%	0.83%

**Table No. 6 Comparison Of Various Studies For Pulmonary Lesions**

Serial no	Studies	Most common N	Least common
1	Hanmante RD et al <sup>9</sup> , N = 100	Oedema N= 26 (26%)	Carcinoma N = 01 (1.0%)
2	Sumaya et al <sup>8</sup> , N = 115	Oedema N= 18(15%)	Carcinoma N = 01(0.86%)
3	Selvom Bigail et al <sup>12</sup> , N = 40	Pneumonia N= 40 (40%)	Normal study N =02 (2.0%)
4	Anisha et al <sup>3</sup> , N = 100	CVC/ Oedema N= 64(64.0%)	Lung abscess N = 01 (1.0%)
5	Present study N = 120	Congestion N = 29(24.16%)	Carcinoma N = 01(0.83%)

**CONCLUSION**

Lungs are the vital organ of the body, functioning as oxygenation organ, enabling breathing and making life possible. Lungs facilitate gas exchange and filter out harmful bacteria/ particles and also contains immune cells that fight bacteria. However, also lungs are the most common site for early infections like pneumonia, TB and occupational disease. Though the pulmonary diseases are commonly encountered clinically, studying of lung tissues not only gives us an insight into the histology of varying stages of different diseases but also is an important educative aid to the pathologists.

It also highlights the importance of identifying potentially lethal infections like Tuberculosis in developing countries. This study highlights various lesions in lungs which were incidental or direct cause of death.

That's why Autopsy study is of great value in improving the diagnostic approach during clinical assessment.

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