

STUDY ON HISTOPATHOLOGICAL SPECTRUM OF VARIOUS NON-NEOPLASTIC LUNG LESION IN AUTOPSY SPECIMEN RECEIVED AT TERTIARY CARE HOSPITAL

Pathology

Dr. Hetal Sabaliya 2nd Year Resident, Shri M. P. Shah Government Medical College, Jamnagar.

Dr. Mushkan Sorathiya* Senior Resident *Corresponding Author

Dr. Ankur Thakkar 2nd Year Resident, Shri M.P. Shah Government Medical College, Jamnagar.

Dr. Nandini J. Desai Professor And Dean, Shri M.P. Shah Government Medical College, Jamnagar.

ABSTRACT

Background & Aims: Lungs are vital organs involved in various disease like infections, inflammatory, non-neoplastic, neoplastic lesions and secondarily in almost all forms of terminal disease. In autopsy internal organ including lungs are studied to determine cause of death and to study prevalence of various lung lesions. So, prophylactic prevention plan can be prepared for prevention of various lung lesion induced mortality and reducing need for invasive biopsy as well. **Material & Methods:** This longitudinal prospective and retrospective study was conducted on 100 cases of death due to any cause autopsied at the Department of Pathology over a period of five years. **Results:** Among these 100 cases, maximum numbers of cases were in the age group of 21 to 30 years followed by 41 to 50 years of age with M:F ratio of 2.5:1. In majority of the present study, cause of death was respiratory failure cases followed by cardiac failure cases. **Conclusion:** This study highlights various lesions in lung confirmed by histopathology, Which were either incidental or direct cause of the death. We should plan to prevent the cause and reduce the prevalence of preventable lung lesion by studying the Histomorphological pattern and cause of death, risk factor and role of smoking and other factor.

KEYWORDS

Lung lesion, Histopathology, Autopsy

INTRODUCTION:

Autopsy is an important and most useful way to find out the condition of internal organs, in which a thorough examination performed on a body after death, to evaluate disease or injury that may be presented and to determine the cause and manner of a person's death. Hundreds of millions of people around the world suffer from preventable chronic respiratory diseases. The lungs are commonly involved in various inflammatory, infective, neoplastic and other lesions but they are secondarily involved in almost all form of terminal events due to cardiovascular causes. Clinical history, laboratory investigation and imagine studies give supportive information but pathological diagnosis is required for confirmation. This avoids the patient from more invasive procedure. Therefore it is important to determine the leading causes of death to establish correct prophylactic, which is the least expensive strategy for preventing further pulmonary dysfunction. A large number of conditions involved the parenchyma of lung with inflammation, fibrosis or Granulomatous reaction.¹ The non-tubercular pulmonary disease are recognized in greater number with use of newer method of diagnosis viz. bronchial biopsy, FNAC, bronchoalveolar lavage specimen, cytological examination, special staining, electron microscopy, immunohistochemistry, enzyme Chapter Heading 2 linked immunosorbent assay (ELISA) and polymerase chain reaction (PCR).

Aims And Objectives:

- This study is designed to determine incidence and prevalence of various non-neoplastic lesions of lung by Histopathological examination at autopsy.
- To determine the common cause of death due to lung pathology by correlating the Histopathological findings with postmortem changes.
- To study epidemiological profile of lung pathology in autopsy.

MATERIAL AND METHOD:

Design Of Study: longitudinal study

Duration Of Study: 5 years study

Sample Size: Total 100 cases

Study Area: Department of pathology.

All cases of lung autopsy will be included in study irrespective of age, sex and cause of death. Autolyzed lung specimens will be excluded from study. This study is conducted to determine incidence and prevalence of various non-neoplastic lesions of lung by Histopathological examination at autopsy. And to determine the common cause of death due to lung pathology.

RESULTS

In the present study total 100 cases were studied, wide age range was observed from 1 to 80 years. Maximum number of cases were in the age group of 21 to 30 years (28.00%) and Male predominance. It was observed that majority was natural 90.00% (90 cases) death followed by accidental 06.00% (6 cases) and suicidal 5.00% (5 cases).

There were 28 cases of female out of them 89% were non-pregnant and 11.0% female had history of pregnancy or postpartum bleeding.

Table – 1 Distribution Of Cases According To Most Common Presentation

Common Presentation	No. of cases	Percentage
Sudden Death	38	38.00%
Breathlessness	15	15.00%
Fever	10	10.00%
Hematemesis	10	10.00%
Chest Pain	04	4.00%
Other	23	23.00%
Total	100	100.00

Out of 100 cases, 38.00% (38 cases) of the cases were presented with sudden death followed by 15.00% (15 cases) with breathlessness, 10.00% (10 cases) with fever, Hematemesis and 4.00% (4 cases) with chest pain.

Table – 2 Distribution of cases according to significant Gross

Significant Gross Finding	No. of cases	Percentages
Not remarkable	85	85.00%
White patches	04	4.00%
Millet Nodules	03	3.00%
Bulla	03	3.00%
Cavity (2pus filled, 1 hemorrhagic)	03	3.00%
Cyst	02	2.00%
Total	100	100%

In this study 90 cases (90.00%) were grayish brown in color followed by 07 (7.00%) cases grayish white in color and 03 cases (3.00%) were reddish black in color among 3 case of reddish black lung 2 were infant and 1 case of burn.

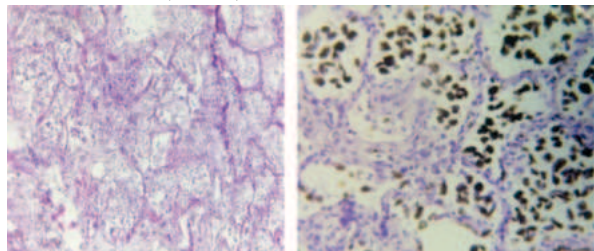
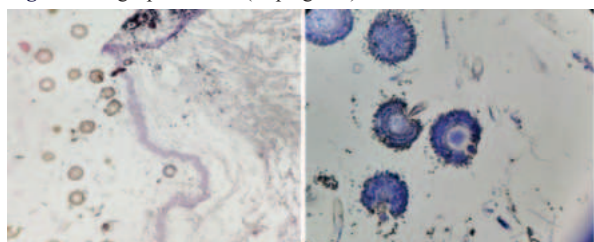
Out of 100 lung autopsy observed for any other significant morphological finding, out of them 85 cases (85.00%) were not remarkable, 4 cases were with white patches, 3 cases of millet size nodule, cavity (2 pus filled and 1 hemorrhagic cavity) and bulla followed by 2 cases of cyst were observed.

Table -3 Distribution of cases according to predominant Histopathological changes in lungs (n = 100)

No.	Pulmonary Lesion	No. of cases	Percentage
1	Pulmonary edema	27	27.00%
2	Venous Congestion	20	20.00%
3	Pneumonia	13	13.00%
4	Tuberculosis	11	11.00%
5	Combine Pathology	04	4.00%
6	Diffuse Alveolar Damage(DAD)	04	4.00%
7	Not Remarkable Pathology(NRP)	04	4.00%
8	Emphysema	03	3.00%
9	Type II Alveolar Pneumocyte Hyperplasia	03	3.00%
10	Autolysis	03	3.00%
11	Pulmonary Embolism(PE)	03	3.00%
12	Carbon Pigmentation	03	3.00%
13	Fat Embolism	01	1.00%
14	Malarial Pigmentation Laded macrophage	01	1.00%
	Total	100	100.00

Among the Pathological findings detected in lung autopsies, pulmonary edema in 27 cases (27.00%) and Venous congestion 20 cases (20.00%) were the commonest pathology seen. Followed by 13 cases (13.00%) of pneumonia, 4 cases (4.00%) of Diffuse Alveolar damage, 3 cases (3.00%) of Emphysema, type II Alveolar Pneumocyte Hyperplasia, pulmonary embolism and carbon pigmentation. Only 1 case (1.00%) of Fat embolism and 1 case (1.00%) of malarial pigmentation laded macrophage in lung parenchyma were observed.

It was observed that in majority of cases (30.00%) smoking was common addiction and hypertension was observed in 25(25.00%) cases. Out of total 11 cases of tuberculosis, Hematemesis were observed in 5(45.45%) cases followed by fever in 3(27.27%) and breathlessness in 3(27.27%) cases.

**Figure 1** Pneumonia 10 x H & E stain**Figure 2** Fungal pneumonia (Aspergillus) 10 x H & E stain**Figure 3** Carbon pigmentation in alveolar spaces with pigmented alveolar macrophage 40 x H & E stain**Figure 4** Fungal pneumonia (Aspergillus) 40 x H & E stain

DISCUSSION:

The observations of the present study and their correlation with other studies are discussed in following paragraphs:

In present study, pathological lesions were seen in 93 (93.00%) cases. Findings were similar in study done by Selvam et al (2011-2012)⁴⁷; lesions were seen in 108 cases (90%) out of 120 cases and study done by Mangal et al (2016)⁴⁸ showed lesions in 1549 cases (90.32%) out of 1715 cases.

Age

In the present study, maximum numbers of cases were in the age group of 21 to 30 years (28.00%) followed by age groups of 41 to 50 years (20.00%) and 31 to 40 years (16.00%). Finding was similar to study done by Mangal et al which was 45.6% (2016).⁴⁸

Sex

Males (72.00%) and females (28.00%) with M: F ratio of 2.5:1. Male were more affected in present study as males are vulnerable for various diseases due to exposure of occupational risk factors and also due to addiction to smoking and alcohol.

Cause Of Death

In majority cases of the present study, cause of death was respiratory failure 35(35.00%) cases followed by cardiac failure 25(25.00%) cases.

Gross Findings In Lungs

In majority (90.00%) cases of the present study, grayish brown and congested lungs were observed while in 7 cases (7.00%), grayish white in color with frothy fluid on cut section and in 3 cases (3.00%) grayish black in color with congestion and hemorrhage were present.

In significant gross finding, out of 100 cases 85 (85.00%) cases were with no any remarkable gross finding followed by 4 (4.00%) cases of white patches on cut section, 3 (3.00%) cases of millet size nodules present, 3 cases of bulla on upper part of lung, 3 small cavity out of them 2 pus filled cavity and 1 hemorrhagic cavity and 2 cyst observed.

Predominant Histopathological Changes In Lungs

In the present study wide varieties of Histopathological features were observed. Although these features were overlapping in some cases We had distributed all the cases according to predominant Histopathological feature in each case.

Table16. Correlation of predominant Histopathological changes with Various study.

Study	Pulmonary edema & Congestion	Pneumonia	Tuberculosis	Emphysema
Bal et al (2008)	-	9.3%	8.60%	-
Selvam et al (2011-12)	-	-	2.80%	50.00%
Tahir et al (2013) ⁵²	-	4.00%	19.00%	40.00%
Udayshankar et al (2015) ⁴⁹	-	31.81%	22.72%	9.09%
Chauhan et al (2015) ⁵¹	54.32%	14.62%	6.26%	7.76%
Mangal et al (2016) ⁴⁸	77.26%	7.99%	4.08%	0.12%
Khare et al (2017) ⁵³	42.85%	8.90%	14.30%	8.90%
Present study (2023)	47.00	14.00%	11.00%	3.00%

The terminal events which includes pulmonary edema and/or venous congestion in interstitium or pulmonary hemorrhage were one of the most common findings in present study and were similar to Chauhan et al (2015), Mangal et al (2016) and Khare et al (2017).

The result of present study show that among the pulmonary diseases, pneumonia was the commonest disease affecting more commonly persons above 40 years of age (7 cases). There are 13 (13.00%) cases of pneumonia out of 100. Out of 13 cases 1 case of fungal pneumonia (Aspergillus). Males (9 cases) were more commonly affected than females (4 cases). Findings were similar to fang et al (2004) study⁵⁴ which shows 15% cases of pneumonia.

In our study, there were 11 cases of tuberculosis out of 100 cases, among which 3(27.00%) cases are of miliary tuberculosis involving lung, liver, kidney and spleen. Granulomatous lesions are more common on 4th and 5th decade of life. In our study, 7 males and 4 females have Granulomatous lesions. These findings are comparable to hjortn et al study⁵⁵ and similar result also found in sanefugi et al study⁵⁶, in which 19% cases are of miliary TB among tuberculosis cases.

The result showed that there are 4(4.00%) cases of diffuse alveolar damage, among them 2 cases were in before 10 year 2 was after 20 year.

The result showed that there are 3 cases of emphysema out of 100 cases. All are male and having history of smoking present. Which were similar to the Niazi⁵⁷ in her —Morphological study of pulmonary embolism in autopsy cases! found greater number (77.5%) of emphysema cases in smokers.

In rest of cases, 3(3.00%) cases were of pulmonary embolism and all were found in female and in 2nd to 3rd decade of life. Out of 3 female 2

were having history of post partum bleeding or pregnancy.

One case of fat embolism was detected in male 4th decade with history of tibia fracture.

One case of malarial pigment laded macrophage found in lung parenchyma in the male in 2nd decade of life.

In 4 cases lung were with normal morphology and 3 cases shows changes of autolysis.

CONCLUSION:

The present study was conducted in our hospital to study incidence and prevalence along with histomorphology of various non neoplastic lesion of lung received at autopsy. Total 100 autopsy cases were studied, following conclusions are made:

1. The study shows Histopathological spectrum of various non neoplastic lung lesions in autopsy specimen received at tertiary care hospital.
2. The process of lung damage may begin in early and continue for decade, leading to both nonfatal and fatal events. From present study of autopsy specimens of lungs, most common findings were terminal events followed by pneumonia and tuberculosis. We should plan to prevent the cause and reduce the prevalence of preventable lung lesion by studying the histomorphological pattern and cause of death, risk factor and role of smoking and other factor.
3. Despite recent advances in diagnostic technology, there are large number of cases of preventable respiratory disease for which autopsy has remained an important complementary tool for identifying and understanding. Histomorphological study of lung in autopsies may quite often disclose common disease affecting lungs and their relative contribution towards death.

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