ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 07 | July - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF LUNG LESIONS AT AUTOPSY: A HISTOPATHOLOGICAL STUDY AT TERTIARY CARE HOSPITAL

Histopathology

Dr Pratibha Bharatbhai Rathwa* MBBS MD Pathology Senior Resident At GMERS Medical College, Gotri, Vadodara *Corresponding Author

Dr Shobhana Ashok Prajapati MBBS MD Pathology Assistant Professor, Dept. Of Pathology, Medical College Baroda, Vadodara

ABSTRACT

The lungs are more commonly involved in various inflammatory, neoplastic and other disease processes as well as also secondarily involved by all forms of terminal events due to cardiovascular causes. Gross pathologic examination of autopsy lungs provide information regarding the status of lung- collapsed or hyperinflated, presence of scarring, fibrosis, bullae, consolidation, nodules, infarction, secretions, edema, congestion, granuloma/abscess formation and also provides information regarding status of bronchi and pleura which may provide hint to the diagnosis. **Aims And Objectives:** To study the prevalence of lung diseases in medicolegal autopsies according to age groups, gender and morphological lung lesions which was confirmed by histopathological examination. **Materials And Methods:** 400 cases were received in autopsy section, pathology department at a tertiary care centre from June 2021 to October 2022.The lungs were weighed, measured and grossly examined.4 mm to 5 mm thick tissue sections from representative area were taken, processed and stained by hematoxylin and eosin staining. All histological sections examined under microscopically and findings were noted. **Results:** Total 400 cases were studied, out of them 17 had unremarkable pathology, while in 383 cases had significant microscopic findings. Most affected age group was 16-30 years followed by 31-45 years, 46-60 years >60 years and newborn to 15 years. Males were more affected than females. Congestion and edema was the most common finding seen in present study. Second most common finding was inflammatory lesion in which maximum number of cases were noted in pneumonia followed by interstitial inflammation and Granulomatous inflammation **Conclusion:** Facilities of histopathological examinations of the autopsied tissues are available only in small number of institutions which often leads to delay and damages to the autopsy tissue samples. Factors like inadequate sampling, improper fixation and failure to send representative sections leads to contradiction between autopsy finding and histopathological examination

KEYWORDS

Lung lesions, Histopathology, Autopsy

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 persons's death. Examination of all the three cavities of body including cranium, thorax and abdomen are an essential part of autopsies.In thorax, lung examination is the most important part of both the medicolegal as well as clinical autopsies.[1]

Millions of people around the world suffer from preventable chronic respiratory diseases. The lungs are more commonly involved in various inflammatory ,neoplastic and other disease processes.

Autopsy is an important and most useful way to find out the condition of internal organs and to evaluate any localized lesions or systemic disease and hence determine cause of death.[2]

MATERIALS AND METHOD:

This study was carried out in the department of Pathology at a tertiary care centre from June 2021 to October 2022.All consecutive cases received under medicolegal autopsy during that period, irrespective of age and sex, were included in this study. The lungs were weighed, measured and grossly examined for color, consistency and any visible lesion.4 mm to 5 mm thick pieces from representative area of lung were taken. The sections which were fixed in 10% formalin, kept in cassettes and after routine processing, paraffin embedded, blocks were prepared.

3-4 micron thick sections taken from block followed by hematoxylin and eosin staining. All the histological sections examined microscopically and findings were noted.

RESULTS:

In present study, 383 cases had significant microscopic findings while 17 cases had no remarkable pathology. Most commonly affected age group was 16-30 years followed by 31-45 years,46-60 years,> 60 years and 0-15 years. Males were more commonly affected than females.

Congestion and edema was the most common finding seen in present study. Second most common finding was inflammatory lesion in which maximum number of cases were noted in pneumonia followed by interstitial inflammation and Granulomatous inflammation.

Concomitant lesions were noted which include edema and congestion with presence of sickle RBCs in blood vessels, Congestion with presence of thrombi in blood vessels, pneumonia with abscess formation, pneumonia with organization, bronchopneumonia with organization, Tuberculous inflammation with pneumonia, Tuberculous inflammation with bronchopneumonia, adenocarcinoma with pneumonia, well differentiated squamous cell carcinoma with granuloma formation, Metastatic invasive ductal carcinoma with pneumonia.

Other findings like premature WBCs seen in blood vessels were also noted in present study.

Table 1: Age Wise Status Of Lung Tissue On Histopathology

Age	Normal lung	Diseased lung	Total
Newborn to 15 years	1(0.25%)	4(1%)	5(1.25%)
16-30yrs	4(1%)	136(34%)	140(35%)
31-45yrs	5(1.25%)	130(32.5%)	135(33.75%)
46-60yrs	3(0.75%)	89(22.25%)	92(23%)
>60yrs	4(1%)	24(6%)	28(7%)

Table 2: Age Wise Distribution Of Lung Lesions

Lesion	Newborn to 15yrs	16-30yrs	31-45yrs	46-60yrs	>60yrs	Total(%)
1) Congestion and edema	2(0.5%)	103(26.89%)	79(20.62%)	62(16.18%)	13(3.39%)	260(67.88%)
2) Chronic venous congestion	-	3(0.78%)	10(2.61%)	6(1.56%)	1(0.26%)	20(5.22%)
3)Acute Respiratory Distress Syndrome		2(0.5%)	-	-		2(0.5%)
4)Acute Respiratory Distress Syndrome with fungal hyphae	-	-	-	-	1(0.26%)	1(0.26%)
5)Inflammatory	-					89(23.23%)
i)Interstitial Inflammation	1(0.26%)	6(1.56%)	17(4.43%)	6(1.56%)	4(1%)	29(7.57%)
ii)Pneumonia		10(2.61%)	12(3.13%)	7(1.75%)		34(8.87%)
iii)Bronchopneumon		2(0.5%			1(0.26%)	3(0.78

ia iv)Granulomatous - Granuloma - Tuberculous Inflammation v) Fungal infection	1(0.26%)	) 2(0.5%) 4(1%) 1(0.26%)	1(0.26%) 5(1.25%)	6(1.5%)	2(0.5%)	%) 4(1.04%) 18(4.69%) 1(0.26%)
6)Emphysematous change	-	-	1(0.26%)	-	-	1(0.26%)
7)Lipoid pneumonia	-	-	1(0.26%)	-	-	1(0.26%)
8)Thromboembolism	-	-	2(0.5%)	-	-	2(0.5%)
9)Immature WBCs in alveoli	-	2(0.5%)	-	-	-	2(0.5%)
10)Malignancy 1)primary i)Adenocarcinoma ii) Well differentiated squamous cell carcinoma 2)Metastatic i) round cell tumor ii)Adenocarcinoma iii) Invasive Ductal Carcinoma			1(0.26%)	1(0.26%) 1(0.26%)	1(0.26%) 1(0.26%)	5(1.30%) 1(0.26%) 1(0.26%) 1(0.26%) 1(0.26%) 1(0.26%)

DISCUSSION:

Table 3: Comparison Of Distribution Of Lung Lesions In Autopsy Cases Reported By Other Authors

Study Group	Year	Total Cases	Lung(Pathological lesions) present	Lung(Pathological lesions) absent
Hanmante RD et al [3]	2014	120	110(91.7%)	10(8.3%)
Shweta et al[4]	2015	150	138(92%)	12(8%)
Amin NS et al [5]	2017	410	353(86.10%)	57(13.90%)
Khare P et al [1]	2017	86	60(69.77%)	26(30.23%)
Momin YA et al [6]	2018	300	270(90%)	30(10%)
Kour B et al [7]	2019	200	150(75%)	50(25%)
Gunja RS et al[8]	2019	35	29(82.8%)	6(17.2%)
Present study	2023	400	383(95.75%)	17(4.25%)

Table 4: Comparison Of Age Wise Distribution Of Lung Lesions In Autopsy Cases Reported By Other Authors

Age	Present Study	Kaur B Singh et al[7]	Shetty A et al[9]
0-15 years	4(1%)	2(1.20%)	29(8.3%)
16-30 years	136(35.5%)	58(34.93%)	60(17.19%)
31-45 years	130(33.94%)	52(31.32%)	117(33.52%)
46-60 years	89(23.23%)	31(18.67%)	91(26.07%)
>60 years	24(6.26%)	23(13.85%)	52(14.89%)
Total	38	166	349

Table 5: Comparison Of Spectrum Of Lesions In Various Studies

Lesion	Present study	Kaur B singh et al[7]	P Garg et al[10]	Ayushi G et al[11]
1)Congestion and edema	260(67.88%)	138(81.65%)	58(59.18%)	21(25.60%)
2)Chronic venous congestion	20(5.22%)	-	-	-
3)Acute Respiratory Distress Syndrome	2(0.5%)	2(1.18%)	-	-
4)Acute Respiratory Distress Syndrome with fungal hyphae	1(0.26%)	-	-	-
5)Inflammatory i)Interstitial	29(7.57%)	1(0.59%)	-	8(9.75%)
Inflammation ii)Pneumonia iii)Granulomatous Granuloma Tuberculous Inflammation iv)Fungal infection	37(9.66%) 4(1.04%) 18(4.69%) 1(0.26%)	20(11.83%) - 7(4.14%)	7(7.14%) 9(9.18%) -	45(54.87%) - 4(4.87%)
6)Emphysematous change	1(0.26%)	1(0.59%)	23(23.46%)	4(4.87%)
7)Lipoid Pneumonia	1(0.26%)	-	-	-
7)Thromboembolism	2(0.5%)	-	-	-
9)Immature WBCs in blood vessels	2(0.5%)	-	-	-
10)Malignancy	5(1.30%)	-	1(1.02%)	-
Total	383	169	98	82

Comparison of lesions with various studies is shown in table 11. In the present study Congestion and edema were seen in 260 cases(67.88%) which was comparable with Kaur B singh et al[7](138 cases,81.65%), P Garg et al [10](58 cases,59.18%)and Ayushi G et al[11](21 cases,25.60%).

Two cases of Acute respiratory distress syndrome were seen in present study which was comparable with Kaur B singh et al[7](2 cases,1.18%).

In present study, interstitial inflammation was seen in 29 cases(7.57%) cases which was comparable with Kaur B singh et al[7] (1 case,0.59%) and Ayushi G et a[11](8 cases,9.75%).

37 cases of pneumonia were seen in present study which was comparable with Kaur B singh et al[7](20 cases,11.83%), P Garg et al [10](7 cases,7.14%) and Ayushi G et al [11](45 cases,54.87%).

In the present study, 4 cases of granulomas were seen which was comparable with P Garg et al[10](9 cases,9.18%)

18 cases of Tuberculous Inflammation were seen in present study which was comparable with Kaur B singh et al[7](7 cases, 4.14%),Ayushi G et al [11] (4 cases,4.87%).

In present study one case of emphysematous change was seen which was comparable with Kaur B singh et al[7](1 case,0.59%), P Garg et al[10](23 cases,23.46%) and Ayushi G et al[11] (4 cases,4.87%).

Malignancies were noted in 5 cases at present study which was comparable with P Garg et al[10](1 case,1.02%)

Table 6: Comparison Of Concomitant Lesions With Various Studies

Histopathological diagnosis	No. of cases in Present study	No. of cases in Patel CB et al[2]	No. of cases in Udayshankar et al [12]
1)Congestion,edema with presence of sickle RBCs in blood vessels	5	-	-
2)Congestion with presence of thrombi in blood vessels	2	-	-
3)ARDS with fungal hyphae	1 11	-	-
4)Pneumonia with abscess formation	2	1	1
5)Pneumonia with organization	4	-	-
6)Organizing Pneumonia with aspergillus	1	-	-
7)Bronchopneumonia with organization	1	-	-
8)Tuberculous Inflammation with pneumonia	5	5	1
10)Well differentiated Squamous Cell carcinoma with granuloma	1	-	-
11)Metastatic Invasive Ductal Carcinoma with Pneumonia	1	-	-
12)Adenocarcinoma with pneumonia	1	-	-
13)Pneumonia with diffuse	-	7	-

alveolar damage			
14) Pneumonia with bronchiolitis	-	2	-
15)Pulmonary tuberculosis with pneumoconiosis	-	1	-
16)Pulmonary thromboembolism with diffuse alveolar damage	-	1	-
17)Tuberculosis with edema	-	-	4
18)Pneumonia with edema and emphysematous changes	-	-	5
19)Pneumonia with emphysema	-	-	1
20)ARDS with edema and emphysematous changes	-	-	2
Total no of cases with more than one pattern	24	17	14

Comparison of concomitant lesions with various studies was shown in table 6.In present study pneumonia with abscess formation were seen in 2 cases which was comparable with Patel CB et al [2] and Udayshankar SK et al [12].Abscess is the most common complication. Aspiration of infected material or foreign body leads to impaired drainage of fluid or aspirated material which causes inflammation induced vascular obstruction, tissue necrosis and liquefaction and thus leads to abscess formation.

In present study Tuberculous Inflammation with Pneumonia were seen in 5 cases which was comparable with Patel CB et al [2] and Udayshankar SK et al[12].After abscess tuberculous inflammation with pneumonia was the second most common complication, which is due to superadded bacterial infection in persons with low immunity and also due to long term use of multidrug resistant TB medication.

In our study there were 2 cases, in which immature WBCs were seen in blood vessels with no available history. Possibly these were cases of leukemia.

Five cases of sickle cell RBCs were seen in blood vessels, in which one case was known case of sickle cell anaemia. Hypoxia due to exertion induces a chain of events in a person with sickle cell anemia that causes sickling, leading to vascular occlusion potentiating hypoxia and culminating in sudden death. In remaining cases history was not available. Two cases of thromboembolism were noted. Pulmonary embolism (PE) can cause a lack of blood flow that leads to lung tissue damage. It can cause low blood oxygen levels that can damage other organs in the body, too. Pulmonary embolism, particularly a large PE or many clots, can quickly cause serious life-threatening problems and, even death.

Total 5 cases of malignancy were noted in our study. Two cases were of primary origin in which one case of adenocarcinoma and second case was of well differentiated squamous cell carcinoma. Three cases of metastatic carcinoma were seen in present study. First case was of Metastatic round cell tumor in which tumor cells seen in round shape with inconspicuous nucleoli and hyperchromatic nuclear chromatin. Second case was of Metastatic adenocarcinoma which was seen in female. Microscopically, tumor cells were arranged in glandular pattern with surrounding normal lung parenchyma. Tumor cells were cuboidal to columnar in shape with prominent nucleoli and salt and pepper chromatin. Adenocarcinoma from gastrointestinal tract, prostate and ovary metastasize to lung. However, most common cause of metastasis is from gastrointestinal tract. Metastatic invasive ductal adenocarcinoma was the third case ,which was known case of Invasive ductal carcinoma. Microscopically tumor cells were seen surrounding normal lung parenchyma.

CONCLUSION:

The histopathological examination helps in establishing the final cause of death. In addition to that it also provides additional information about prevalence of nosocomial infections in critical areas of hospital, prevalence of chronic infective diseases like tuberculosis and diseases related to pollution and work place environment, as was found in our series.

The short coming in present study was non receipt of whole organ or representative sample at the time of autopsy, and unavailability of proper history which if overcome will set much higher standard of autopsy reporting and would be a more useful tool in understanding cause of death.

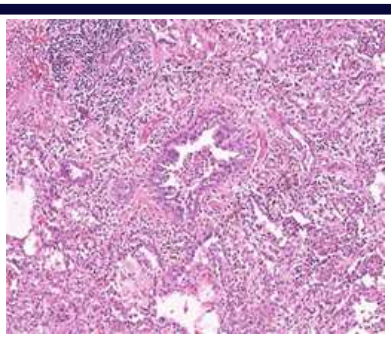

Figure 1: H and E stain(40x view):Bronchopneumonia

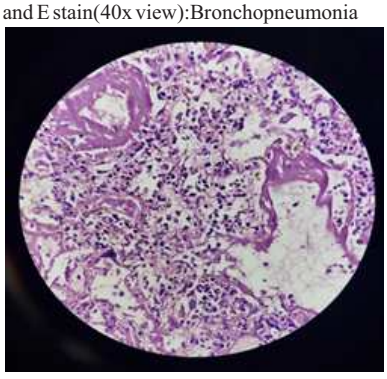

Figure 2: H and E stain(40xview):Acute Respiratory Distress syndrome

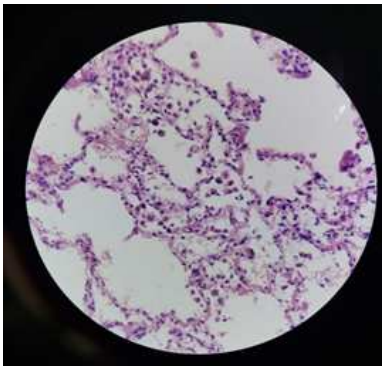

Figure 3: H and E stain (40x view):Chronic venous congestion lung having hemosiderin laden macrophages in alveoli

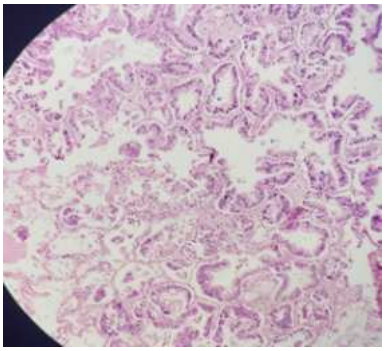

Figure 4: H and E stain(40x view):Metastatic Adenocarcinoma

REFERENCES

1. Pratima Khare, et al. Prevalence of lung lesions at autopsy: A Histopathological Study. JCDR(Journal of Clinical and Diagnostic Research) 2017;11(5):EC13-6.
2. Patel CB, Patel K, BhagatV M,Shah P. Pattern of histopathological lesions in lung auopsy.Int J Res Med Sci 2018;6:279-83
3. Hanmante RD, Chavan YH, Mulay PS, et al. Histopathological patterns of lung lesions in autopsy cases. International Journal of Advance in Health Sciences 2014;1(1):15–9.
4. Shweta, Mahayan D, Mahajan V, Angmo P. Histopathological pattern in lung Autopsy in Government Medical College Jammu. Journal of Evolution of Medical and Dental Sciences. 2015;4(91):15694-96
5. Amin NS, Shah PY, Patel RG,KhantVS,Prajapati SG et al. Histopathological alterations in lung tissue received as autopsyspecimens–a study of 410 cases. Int J Med SciPublic Health 2017;6:327–30.
6. Momin YA, Patil D, Suladhal SS. Histopathological study of lung lesions in autopsy cases. International Journal of Scientific Research. 2018;7(12):34-37

7. Kour B, Singh K, Kaur A. Histopathological spectrum of lesion in lung autopsy-A one year retrospective study. International Journal of Research and Review. 2019;6(8):168-71.
8. GunjaRS,KmablaGM,NattaBR,Histopathological Spectrum of Lung Lesions in Autopsy,IOSR Journal Of Dental and Medical Sciences(IOSR-JDMS),vol. 18,no.6,2019,pp 16-203.
9. Shetty A. C. Vijay. A five year study of lung lesions in medico-legal autopsies from a pathologist's perspective. J DiagnPatholOncol 2018;3(4):344-349
10. Garg P, Sharma A, Kundal RK. Spectrum of pulmonary histopathological lesions: A study of 100 autopsy cases. JMSCR. 2017;5(12):31304-08.
11. Aayushi Guru,HariomMeena,SanjunaDharmalingam,NikitaSingh.Study of histopathological spectrum of non-neoplastic lesions of the lung in autopsy specimen,November 2022,Asian Journal of Medical Sciences 13(11):260-264
12. Udayashankar SK, Shashikala P, Kavita GU, Pruthvi D. Histomorphological pattern of lung in medicolegal autopsies. Internat J Sci Res. 2015;4(7):1937-39.