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Spectrum of lung pathology in medicolegal autopsies at rural teaching hospital: A two-year study

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***Abstract*---**Background: Lungs are the major organs involved by a number of infectious, inflammatory and occupational hazards. They are also involved secondarily by all forms of terminal events like cardiovascular events. Autopsy is a part of pathology that serves as an important tool to identify the cause and manner of death and to learn about methods to prevent them. Methods: This is a retrospective study conducted on the autopsy specimens received in the department of pathology from 1 January 2020 to 31 December 2021. Gross findings were noted at the time of autopsy and the specimen was subjected to routine histopathological processing and hematoxylin and eosin staining. Histopathological findings were noted. Results: Out of total 78 cases, 30.17% shows Congestion and oedema, 24.65% shows Pneumonia. 10.95% and 8.21% shows interstitial changes in the form of interstitial pneumonia or mononuclear interstitial infiltrate and Diffuse alveolar damage respectively, 6.84% shows emphysematous changes and 5.84% shows chronic passive venous congestion. 4.1% cases shows findings of tuberculosis and only 1 case was of lung abscess, metastatic papillary renal cell carcinoma and fibrin thrombi each. Highest number of cases (32) belonged to 16-30 age group. Least number of cases (2) were from >75 age group. Conclusion: Although the pulmonary diseases are commonly seen clinically, the autopsy gives an insight into the

histopathology of various diseases as well as to plan preventive strategy to reduce mortality due to lung pathology.

***Keywords*---**autopsy, pneumonia, tuberculosis, lung, pathology.

Introduction

Lung disorders till date have continued to capture the interest of the medical fraternity because of its varied and complex presentations. Studies have documented 20% to 30% of sudden deaths being attributed to underlying lung pathology. The lungs are vulnerable to a wide range of inflammatory, infectious, neoplastic and other pathological conditions and almost always involved secondarily by terminal events of cardiovascular disease.[1] Modern diagnostic tests are costly and sometimes clinicians have less time for diagnostic work up due to rapid progression of disease. Therefore, it is very important to determine the common cause of death and prevalence of various lung lesions to prepare a prophylactic plan for prevention of such lung lesions induced mortality. [2]

Aim and Objective

To find the spectrum and frequency of various lung lesions in autopsy specimens in a tertiary care centre in Western Maharashtra.

Materials and Methods

A retrospective cross-sectional study was carried out in the department of Pathology of a medical college, Loni over a period of two years from January 2020 to December 2021.

Inclusion Criterion

All the lung specimens obtained from medicolegal autopsy received in the department of Pathology during the study period. Lungs were fixed in 10% neutral buffered formalin and weight was measured before doing the grossing of the specimen. Lungs were examined for consistency, colour, areas of consolidation, infarction, oedema, exuding froth and haemorrhage. Representative sections from each lobe were taken including extra sections from areas grossly looking abnormal. All the histological sections were stained with Haematoxylin and Eosin stain. Special stains like Zeil-Neilson and PAS were asked for when required. The stained sections were then observed under microscope and findings recorded. Detailed record of all medico-legal autopsies during the study period regarding above details was obtained.

Results

A total of 78 cases were studied according to our inclusion criterion from January 2020 to December 2021. Among included cases, 43 were males and 35 were females. Maximum number of deaths were seen in 16 to 30 age group. Out of 78 cases, 73(93.6%) showed presence of significant pathological microscopic

findings. The cases not showing any specific pathology were excluded from the study.

Table 1: Distribution of Findings on histopathological Examination

State of Lung Specimen	No. of cases	Percentage
Pathological findings	73	93.6
Normal Histology	05	6.4
Total	78	100

Out of 73 cases included in the study, 39 (53.42%) were males and 34(46.57%) were females. Gross findings of the lungs were as given in table 2:

Table 2: Gross examination findings of Lungs

Gross Findings	No. of cases	Percentage
Haemorrhagic	32	43.83
Consolidation	24	32.87
Focal grey/brown area	05	6.84
Unremarkable	14	19.17
Total	73	100

Table 3: Age wise distribution of lung pathology

Pathology	NB-15y	16-30y	31-45y	46-60y	61-75y	>75y	Total cases	Percentage
Congestion and oedema	01	10	05	04	02	-	22	30.17
CPVC	-	-	02	01	01	-	04	5.47
Pneumonia	01	07	06	02	01	01	18	24.65
Interstitial Changes	01	04	01	01	01	-	08	10.95
Emphysema	-	01	01	01	01	01	05	6.84
Fungal Pneumonia	-	01	-	-	01	-	02	2.73
Tuberculosis	-	01	01	01	-	-	03	4.10
Abscess	-	01	-	-	-	-	01	1.36
DAD	-	05	-	-	01	-	06	8.21
Foreign Body	-	01	-	--	-	-	01	1.36
Malignancy	-	-	--	01	01	-	02	2.73
Shock	-	01	-	-	--	-	01	1.36

CPVC: Chronic passive venous congestion
DAD: diffuse alveolar damage
NB: New born
y: age in years

Highest number of cases (32) received were in 16-30 age group. Least number of cases (2) were received from >75 age group. Congestion and oedema were the

commonest findings in our study (30.17%). Pneumonia was the second most common finding (24.65%). Interstitial changes in the lungs in the form of interstitial pneumonia or mononuclear interstitial infiltrate and Diffuse alveolar damage were seen in 10.95% and 8.21% of cases respectively. Emphysematous changes were seen in 6.84% of cases. Evidence of chronic passive venous congestion was noted in 5.84% cases.

Tuberculosis in the form of cavitary tuberculosis and a single case of miliary tuberculosis were seen in 4.1% cases. Other granulomatous lesions were fungal granuloma in 2 cases and a foreign body granuloma in 1 case. A single case of lung abscess was noted. An interesting case of Adenocarcinoma was noted and one case of Metastasis from papillary renal cell carcinoma was also noted. One case of septic shock showing fibrin thrombi and a single case showing vegetative matter was also seen.

Discussion

The present study had the maximum cases from second and third decade of life unlike the studies by Shetty et al[1], Patel et al[3] and Tahir et al[4]. Males were more than females, in accordance with the studies done by Shetty et al[1] and Kurawar et al[5]. Congestion and edema were the most common findings in present study (30.1%), which was similar to the studies done by Shetty et al[1], Kurawar et al[5] and Chauhan et al[6]. Congestion and edema occurring due to dysfunction of the left ventricle, justifies the heart failure and the terminal events that lead to death.[1]

Infectious diseases have been a major contributor to top mortality and morbidity in our country.[1] The present study shows that it is the second most common pathology(28.7%), which was comparable to the studies by Goswami et al[2] and case Selvambigai et al[7]. The studies done by Shetty et al[1] and Kurawar et al[5] showed pneumonia in nearly 20% cases. Maximum cases were of lobar pneumonia (24.6%), two cases of Fungal pneumonia (2.7%) and a single case of lung abscess (1.3%). Prolonged hospitalisation increases the chances of pneumonia which also was the reason of higher prevalence in present study. Hospital acquired infections, ventilator associated pneumonia with prolonged ventilation (more than 5 days) are the predominant contributors to the death of the patient[1].

Interstitial pneumonia was seen in 10.9% cases and so was Diffuse alveolar damage (10.9%). Alveolar interstitial pneumonia and diffuse alveolar damage were the most common findings in the study done by Soiero Am et al who studied autopsy findings in HIV/AIDS deaths.[8] The HIV status of these cases in present study was not known, but the pathology could have been attributed to the immune compromised status .

Emphysema is destruction of alveolar septal walls. Decades ago studies have shown that the prevalence is more in males. Emphysematous changes were seen in 6.8% of cases. Khare et al[9] and Chauhan et al[6] have noted the percentage of emphysematous cases to be 8.2% and 7.76% respectively. In present study, the

predominant cases were males like in the studies done by Kare et al[9] and Chauhan et al[6].

Tuberculosis continues to be the one of the most pressing diseases in our country. Kurawar et al[5] and Shetty et al[1] found the percentage of tuberculosis in their study to be 2.53% and 3.3 % respectively. The present study is in agreement with those studies with all the cases being less than 50 years of age. Tahir et al[4] found the percentage of tuberculosis to be 19% in their study, which is significantly more than that in the present study. This could be attributed to the changing and atypical presentations of tuberculosis in a developing country like ours.

A single peculiar case of adenocarcinoma lung was found in a 72 year male. Another case of 60 year male showing metastatic deposits of papillary renal cell carcinoma in both the lungs was seen. A case of 23 year male showing features of aspiration pneumonia and vegetative matter was noted. A single case of 20 years female showing fibrin thrombi which was a feature of septic shock was also noted.

Conclusion

The present study documents the spectrum of lung pathologies in a rural tertiary care hospital in western Maharashtra. Although the pulmonary diseases are commonly seen clinically, the autopsy gives an insight into the histopathology of various diseases as well as to plan preventive strategy to reduce mortality due to lung pathology.

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