

Histopathological Pattern in Lung Autopsy Revealing the Magnitude of Pulmonary Diseases: A Study at SCB Medical College and Hospital, Cuttack, Odisha

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ABSTRACT

BACKGROUND

The lungs are secondarily involved in almost all forms of terminal diseases. An autopsy is mandatory to find out the state of the internal organs. This can reveal the disease that may not be suspected clinically. Total 50 medico legal autopsy cases were studied in the department of pathology, SCBMCH in collaboration with department of forensic medicine & toxicology.

METHODS

Various histologic patterns of pulmonary alteration relating to the identified pulmonary lesions were statistically correlated. The autopsy study was conducted by documenting the age, sex, clinical history, anthropometry, examination of thorax and gross features of the lung.

RESULTS

The results were compared with previous studies 45 (90%) cases showed a definite histopathology pattern. Prevalence of lung pathology was slightly higher in male as compared with female. Pulmonary lesions were examined through six pulmonary alterations namely Acute Lung Injury (ALI), Fibrosis (22%), Chronic Cellular Interstitial Infiltrate (CCII 20%), Alveolar Filling (AF 13%), formation of nodules (15%) and Near Normal Biopsy (NNB 10%) cases. Pulmonary oedema, diffuse alveolar damage & acute pulmonary congestion were included under the purview of acute lung injury (40%). Chronic interstitial lung disease accounted for 15%, pneumonia 11%, granulomatous lesion 8%, emphysema 8%, pneumoconiosis (2%) and malignancy (1.5%). 10% cases of autopsies showed no pathology.

CONCLUSIONS

Even though there are many diagnostic advances to detect lung pathology, more often they go unnoticed where autopsy plays an important role in identifying them.

KEYWORDS

Autopsy, Fibrosis, Alveolar Filling, Nodules, Pneumonia, Interstitial Lung Disease

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BACKGROUND

An autopsy is a medical procedure that consists of a thorough examination of a corpse to determine the cause of death. It is an important audit tool that often disclose new information about the cause of death.¹ The lungs are secondarily involved in almost all forms of terminal disease. Also, a wide spectrum of neoplastic and non-neoplastic diseases affects lungs in millions of people of varied age groups. Several screening programs for lung disease may be responsible for over diagnosis or under diagnosis. Many of them are preventable but clinical and radiological evaluation are sometimes non-specific. All these burdens necessitate for finding out the pattern of pulmonary lesion which will emphasize better understanding of the current scenario. So histopathological examination is the most appropriate tool for diagnosis and proper evaluation. Autopsy of internal organ offers a comprehensive tissue diagnosis procedure.² This helps to determine whether underlying disease and associated comorbidities increase the risk of developing specific histopathological alterations.

METHODS

The present study included consecutive autopsy subjects regardless of age, sex, & cause of death carried out in the department of Pathology & Department of Forensic medicine & Toxicology, SCBMCH, Cuttack from July 2018 to December 2018. In each case, the autopsy study was conducted by following the standard protocol as follows: Age, Sex, Clinical history, Anthropometry, Examination of thorax, Gross features of lung. Histopathological analysis of lungs after anthropometry studies a proper & sequential examination of thorax was conducted. Symmetry, tracheal deviation, muscle/ bone abnormalities and skin lesion were examined for. Y-shaped incision was given followed by reflection of skin & subcutaneous tissues from bony thorax. After removal of chest plate presence of pleural fluid and its quantity and character was examined for. Carefully the attachment of the diaphragm to ribcage were incised & with utmost care & lungs were removed, taking care not to lacerate the organ. Both lungs were examined if they overlap anteriorly (seen in status asthmatic us, COPD, mechanical hyperinflation & drowning). Pleural adhesions were looked for.

Gross inspection of lungs was done with regard to colour, consistency, congenital anomaly, consolidation, nodules, bullae, scarring, infarction or congestion. They were palpated thoroughly followed by its weight & dimension measurement. There moved lungs were kept in sealed container with 10% neutral buffered formalin for 24-72 hours with proper labeling. Parasagittal sectioning was done taking the whole lung from apex to base using along knife. They were serially sectioned with lateral pleural surfaced own on cutting board & hilar region facing up to distinguish more central region from periphery. Partially cut airways & vessels were opened up with scissors for complete examination till the pulmonary lymph nodes were looked for

and sampling was done. After tissue processing, they were subjected to routine H & E staining. During microscopic examination, emphasis was given to note the following features; Bronchi, presence of calcification, bronchioles, acinus and alveoli for macrophages & exudates. Lung parenchyma, pulmonary vasculature and associated lymphoid tissues were also examined.

RESULTS

The autopsy study for pulmonary lesions included a wide range of age group, the lowest being 20 years and highest being 58 years. Sex distribution showed a higher male: female ratio. The cases studied had different causative factors for death which was as follows:

Cause of Death	Numbers
Traumatic injury	17
Systemic disease	13
Asphyxia	9
Sudden Death	5
Poisoning	3
Burn/Electrocution	3

Table 1

Systemic Diseases included COPD, pneumonia, alcohol abuse, chronic kidney diseases, diabetes mellitus, tuberculosis, pneumonia etc. About 45 cases (90%) showed a definite histopathological pattern of pulmonary alteration. 5 cases (10%) showed near normal pulmonary findings. The autopsy cases got examined through the following six pulmonary alterations.³

Case	Percentage
Acute Lung Injury	20%
Fibrosis	22%
Chronic Cellular intestinal infiltrate cell	20%
Alveolar Filling	13%
Nodule Formation	15%
Near Normal biopsy	10%

Table 2

Acute lung injury usually shows alveolar wall edema, intra alveolar edema, fibrin deposition, necrosis and / or inflammatory cell and hemosiderin laden macrophage infiltrates. Fibrosis was seen in varying degrees along with alveolar septal thickening (Included Infiltrate with mononuclear cells and /or granulomas).

Alveolar fillings included cellular elements like inflammatory cells and/or macrophages and non-cellular materials like proteinaceous material, mucus, calcification etc. Nodules were either granulomatous, inflammatory or atypical / neoplastic cell clusters.

Pulmonary edema, diffuse alveolar damage & acute pulmonary congestion were included under the preview of acute lung injury (40%). Chronic interstitial lung diseases accounted for 15% cases, Pneumonia 11%, granulomatous lesion 8%, Emphysema 8%, Pneumoconiosis 2% and malignancy 1.5% and 10% cases showed near normal lung pathology.

DISCUSSION

This study took the opportunity to find out the underlying diseases or pathological condition of the lung specimens at autopsy received for histopathological analysis. It was a prospective cross sectional and non-interventional study. The specimens were processed as per protocol followed by histopathological analysis using routine H & E stain. All cases were distributed with the presence or absence of any pulmonary pathology. About 90% cases (45) showed at least one pattern of histopathological alteration. This was similar to study by Mangal et al⁴ and Sweta et al.⁵ Different spectrum of pulmonary findings with various morphological alterations were in concordance with those of Singade et al. Nodules as a pattern, were mainly composed of granulomas with necrosis which included tubercular and fungal granulomas. Tahir et al found 19% cases to be of Tuberculosis. Nodules composed of atypical / malignant cells were also seen. Most cases were similar to study by Mangal et al.

CONCLUSIONS

The various histomorphological lung patterns represented themselves as potentially significant to the cause of death or previously ongoing pathological conditions or diseases. Various acute pathological conditions were noticed, but still noticeable thing is the patterns of chronic pathological conditions that showed up in a major chunk of medicolegal cases. This signifies the subtle involvement of lung

parenchyma relating to the associated co-morbidities, toxic environmental exposure, behavioural changes & other factors irrespective of the cause of death. Autopsy has remained an important complementary tool for identifying and understanding respiratory diseases concerning their regional variability. Hence all kinds of autopsies should get emphasized not only for the deceased concerned but for the community betterment.

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