



HISTOLOGICAL SPECTRUM OF LUNG LESIONS IN AUTOPSY CASES AT A TERTIARY CARE CENTRE

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ABSTRACT

Autopsy study is of great diagnostic and educational value similar to the dictum "Mortui Vivos Docent". Millions of people around the world are being affected by numerous inflammatory, occupational and neoplastic conditions of lung. The aim of the present study was to analyze the histopathological spectrum of pulmonary lesions in all medicolegal and clinical autopsies. Retrospective data of 260 cases (Medicolegal and Clinical) was collected from postmortem reports over one year and cases with primary lung pathology as well as other cases where lung pathology was the secondary cause of death were studied. Present study showed overall male predominance (M:F=2:1). Maximum age group in present study was 31-40 years. Most common pulmonary lesion in adults, children and newborn were pulmonary edema, interstitial and bronchopneumonia and Meconium Aspiration respectively. Thus, autopsy study in lung diseases forms the best educational tool to solve many diagnostic and legal discrepancies between Clinicians, Pathologist and Forensic experts.

KEYWORDS : Autopsy, Lung, Pulmonary Edema, Pneumonia

INTRODUCTION:

The word autopsy comes from the Greek word "autos - self, opis- view" which literally means "to see for oneself". It is synonymous to Post-Mortem (PM) and Necropsy.^[1] Autopsy refers to self study of a dead body carried out for Medical, Legal or Scientific purpose.^[1] Autopsy is mainly of two types: 1) Clinical/ Pathological- Done by Pathologist to know exact cause of death where legal consent of relatives is mandatory. 2) Medicolegal/ Forensic- Done by Forensic expert under the law of State for the protection of rights of citizens in cases of sudden, suspicious, unnatural or criminal deaths to establish the cause and manner of death. Here consent from relatives may not be required.^[1] Thus, autopsy is carried out to establish the identity, cause, time of death, antemortem or post mortem nature.^[2]

An autopsy includes detailed external examination and dissection of organs from cranial, thoracic, abdominal and pelvic organs.^[1] These findings are further correlated and confirmed by histopathologist after microscopic examination of paraffin sections. Final cause of death is given by Forensic expert only after correlation with histopathological opinion. Thus, autopsy is a major guide to opine about the cause/ manner of death in both Clinical and Medicolegal autopsies. The importance of lung diseases in Pathology and Clinical Medicine is well known. Respiratory diseases have increased around the world due to air pollution, environmental inhalants and chemical toxins.^[3] Millions of people around the world are being affected by preventable lung diseases.^[4] Lungs are affected by numerous infections, inflammatory, occupational and neoplastic conditions.^[5] Lungs are involved not only in primary lung diseases but also are invariably affected in all terminal events leading to death.^[6]

Acute respiratory failure (ARF) is seen in 40-50% of overall

deaths. Clinical and radiological findings in ARF are often non-specific.^[7] In this scenario gross and microscopic findings in autopsy are a boon to arrive at cause of death.^[7] Considering all the pros and cons of Post Mortem, bilateral lungs and pleural cavities should be thoroughly examined by Histopathologist and further correlate with clinical history and radiological findings.

The aim of the present study was: 1) To analyze the histopathological spectrum of pulmonary lesions in all medicolegal and clinical autopsies irrespective of the cause of death. 2) To study the primary pulmonary cause of death as well as all secondary changes in the cause of death from cerebral, cardiac, hepatic, renal or any other reason. 3) To describe the prevalence and pattern of respiratory infections, neoplasm and other non-communicable diseases in this part of Western Vidarbha, Maharashtra, India.

MATERIALS AND METHODS:

Present was a retrospective study conducted at Department of Pathology, GMC, Akola over a period of one year from July 2018 to June 2019. Retrospective data of 260 cases (Medicolegal and Clinical) was collected from postmortem reports. All autopsy cases irrespective of the cause of death were included. However, partial and completely autolyzed specimens were excluded.

Study design: Retrospective, non- interventional and cross section study.

Detailed Medical and Clinical history was obtained from records. In cases where whole lung was received, it was weighed and fixed in 10% formalin. When pieces of lungs were received, dimensions were taken and then fixed.

Floating test was done in cases of drowning and still births. In gross examination, lung parenchyma was meticulously observed for colour, volume, consistency, scarring, fibrosis, consolidation, emphysematous bullae, nodules, infarcts, secretions, edema, granulomas, abscess cavities, bronchial dilatation in bronchiectasis. Pleura was observed for adhesions, fibrosis and effusions. Base of lung was observed for pus pockets.

All pathological areas of whole lung or pieces of lung were adequately sampled. Paraffin blocks were made. 5 micron thin sections were stained with Hematoxylin and Eosin. Wherever needed special stains like PAS, Ziehl Neelsen, Mucicarmine and Reticulin were performed. All histological sections were examined microscopically, findings were recorded and tabulated.

Results: A total of 260 autopsy cases were studied and results obtained were as follows:

The study population ranged from 1 day old infant who died of Meconium aspiration to 85 years old female who died of fever with lobar pneumonia. Maximum deaths were seen in age group of 31- 40 years (21.5%), followed by 21-30 years (20.8%) and 51-60 years (17.7%). 10 deaths were seen in neonates from Meconium Aspiration (5/10), ARPCKD (2/10), Bronchopneumonia (3/10). 10 deaths were seen in infants from Interstitial and Bronchopneumonia (8/10) and Thrombocytopenia(2/10). 7 deaths were seen in Children from 1-10 years from interstitial and bronchopneumonia. Thus, child death contributed to (37/260- 14.2%) and adult death (223/260- 85.8%). [Table 1]

Out of 260 autopsies, male deaths were 176 (67.6%) and female deaths were 84 (32.4%). Male to female ratio was 2:1. Main cause of death in males was IHD and that too in lower age group of 30-60 years, followed by cirrhosis of liver. History of tobacco and alcohol abuse was present in nearly 80% males. [Table 1] Maximum female deaths (n= 27) was seen in young age group of 25-30 years with maternal mortality from antepartum & postpartum hemorrhage and puerperal sepsis (n= 18). [Table 1]

Table 1: Showing age group, sex distribution of autopsy cases (n = 260)

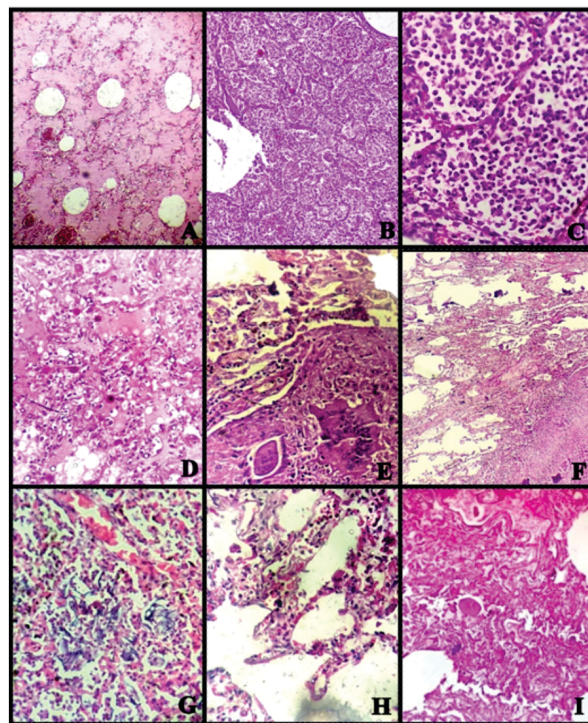
Sr. no.	Age range	Male	Female	Total	Total Percentage
1	Neonate	6	4	10	3.8
2	Infant	4	6	10	3.8
3	1-10	4	3	7	2.7
4	11-20	4	14	15	6.9
5	21-30	27	27	54	20.8
6	31-40	45	11	56	21.5
7	41-50	30	4	34	13.1
8	51-60	39	7	46	17.7
9	61-70	16	3	19	7.3
10	71-80	3	2	5	1.9
11	81-90	0	1	1	0.4
	Total	176 (67.7%)	84 (32.3%)	260	100%

Table 2: showing sex distribution of total number of various pulmonary lesions (n= 260)

Sr. no.	Pulmonary lesions	Male	Female	Total	Total percentage
1	Pulmonary edema with congestion	56	24	80	53.3
2	Interstitial pneumonia	5	6	11	7.3
3	CVC lung	7	3	10	6.7

4	Lobar pneumonia	6	3	9	6
5	Bronchopneumonia	4	4	8	5.3
6	Pulmonary hemorrhage with ARDS	6	1	7	4.7
7	Tuberculosis lung	5	1	6	4
8	Emphysema lung	6	0	6	4
9	Meconium aspiration	3	2	5	3.3
	Infarct	2	0	2	1.3
11	Fungal Mucormycosis	2	0	2	1.3
12	SCC Lung	2	0	2	1.3
13	Adenocarcinoma lung	0	1	1	0.7
14	Corpora Amylacea	1	0	1	0.7
	Total pathological lesions	105	45	150	100%
	Normal lung lesion	71	39	110	
	Total	185	75	260	

Microscopic pictures showing pathological lesions of lung:



A: Pulmonary edema (H & E, 10X); **B:** Lobar pneumonia (H & E, 10X); **C:** Lobar pneumonia (H & E, 40X); **D:** CVC lung (H & E, 40X); **E:** Tuberculosis lung with Langhan giant cell (H & E, 40X); **F:** Tuberculosis lung with fibrocaceous cavity (H & E, 10X); **G:** Fungal mucormycosis (H & E, 40X); **H:** Meconium aspiration (H & E, 40X); **I:** Corpora Amylacea (H & E, 40X)

Most common pulmonary lesion noted was pulmonary edema (53.3%), [Fig. A] followed by Interstitial pneumonia (7.3%), CVC lung (6.7%), lobar pneumonia (6%), [(Fig. B&C) Bronchopneumonia (5.3%). [Table2] CVC of lung with heart failure cells was seen in 10 cases (6.7%) [Fig. D]. All had CCF as terminal cause of death. Tuberculosis with caseating granulomas was seen in active stage in 4 cases (AFB positive) and old healed lesions in 2 cases [Fig. E & F] Emphysema was seen in 6 cases of COPD (4%). All had history of cigarette smoking.

We had a very interesting finding of Corpora Amylacea of lung

which is a very rare finding in the lungs. It is usually seen in prostate as a degenerative change [Fig. I]

DISCUSSION:

Present study showed overall male predominance over females as seen in all cases studied in the literature. Max age group in present study was 31- 40 years, whereas study made by Hanmante et al,^[7] it was 21- 30 years.

Most common pulmonary pathology is pulmonary edema (53.3%) with congestion similar to Soeiro A Metal (2011)^[8], Hanmante R. D. et al (2014)^[7], PratimaKhare et al (2017)^[2]. This similarity may be explained on the basis that, pulmonary edema is the commonest finding in all terminal events before death. Pneumonia is the second common finding (12%) which included Interstitial, Lobar, Broncho Pneumonia similar to findings by Hjorth et al (1995)^[9], Hanmante et al(2014)^[7], Tariq MT et al (2013)^[10], Fang et al (2004)^[11]. This similarity may be explained on the basis that, extremes of age are highly susceptible to pneumonia due to compromised immunity, poor nutrition and poor sanitation.

Meconium Aspiration was noticed in 5 newborns (3.3%). [Fig. H] These were the cases of referred prolonged labor from rural areas to this tertiary care centre. CVC of lung was noticed in 10 cases (6.7%) due to cardiogenic shock and congestive cardiac failure to Selvambigai G. et al (2016)^[5]. Emphysema was seen in 6 cases (4%). These were deaths due to COPD with history of cigarette smoking. Similar to finding by Hanmante et al (2014)^[7] and Tariq Mt. et al (2013)^[10].

Tuberculosis of lung was noticed in 6 cases (4%) – 4 cases had active TB and 2 had healed granulomas. Findings are similar to Manjit S Bal et al (2008)^[6], Tariq et al (2013)^[10] and Hanmante et al (2014)^[7]. This proves that TB is chronic endemic disease in all states of India. Special stain- AFB confirmed active TB. Pulmonary thromboembolism was seen in 2 cases (1.3%) similar to study by Hanmante et al (2014)^[7] and Soeiro et al(2011)^[8].

Neoplasm SCC Lung was seen in 2 male patients and metastatic adenocarcinoma in 1 female patient similar to Tariq et al (2013)^[10]. The number is less as clinical autopsies are usually not done in known cases of malignancy. Mucormycosis was incidental finding in two cases (1.3%), [Fig. G] similar to Khare et al (2017)^[2]. We had one interesting finding of Corpora Amylacea of lung in 80 years old male patient which is quite an unusual finding in lung. We could not get any literature to compare it.

Liimitation:

Due to improper fixation and in cases where only lung pieces were sent instead of whole lung, we could not study representative areas in few interesting cases. This shortcoming would have added further to limitation. Also this study may not represent the actual incidence of pulmonary lesions in our area as only autopsy specimens were studied.

CONCLUSION:

Autopsy study is of great diagnostic and educational value similar to the dictum "Mortui Vivos Docent". It is the best educational data for upcoming Pathologist. It solves many doubts and discrepancies among law, doctors and common man. Despite recent advances in diagnostic technology, autopsy material has remained unchallenged as the best teaching aid. Pulmonary findings of various lesions are certainly helpful to highlight direct cause of death or its associated cause.

Thus, autopsy study in lung diseases forms the best educational tool to solve many diagnostic and legal discrepancies between Clinicians, Pathologist and Forensic experts.

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