

Study of 161 autopsies of lung pathology

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Abstract: Autopsies are carried out to establish the identity, cause of death, time of death, and ante-mortem or post-mortem nature of death. These help in establishing the cause of death and ascertain the disease process which led to death.

Aim: To study the prevalence and pattern of lung diseases in medicolegal autopsies, confirmed by histopathological examination. **Materials and Methods:** This non-interventional, record based cross sectional study was carried out in the Department of Pathology. Tissue bits from lungs, retrieved at the time of autopsy, were preserved in 10% formalin. These were processed and examined microscopically. A total of 161 cases were received during the period of study. **Results:** most of the autopsies showed pneumonia in 71, aspiration pneumonia in 21, edema in 18 and TB in 12 autopsy report

Keyword: Autopsy, Lung Pathology, Pneumonia

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 person's death [1]. Examination of all the three cavities of body including cranium, thorax and abdomen are an essential part of autopsies. In thorax, lungs examination is the most important part of both the medicolegal as well as clinical autopsies. The medicolegal autopsy is carried out by forensic expert to help the law by establishing identity, cause of death, time of death, and ante-mortem or post-mortem nature of crime. The clinical autopsy or pathological autopsy is usually performed by pathologist to establish the cause of death and to study the disease process which led to death [2].

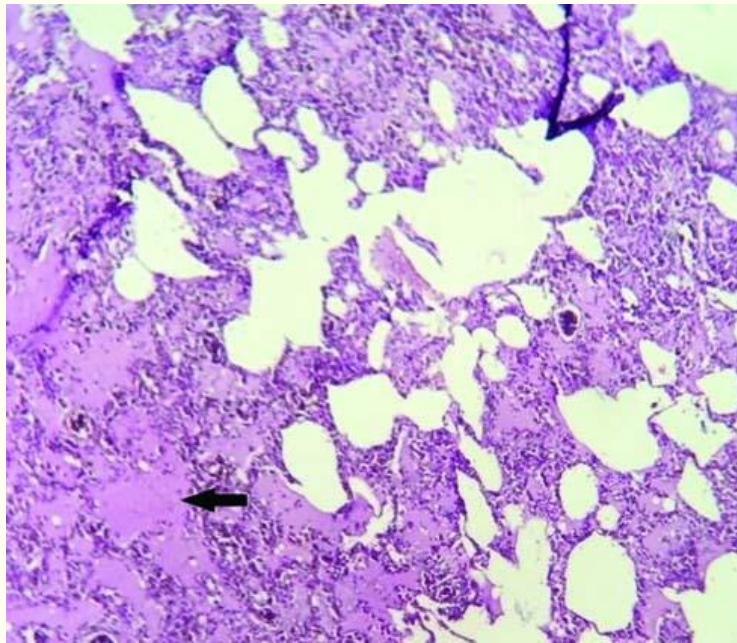
Autopsy is often followed by histopathological examination of tissues from various organs. In cases where tissue is not properly preserved in fixative or the tissue is a non-representative sample, final histopathological report is often not possible. However, despite pitfalls like delays in carrying out autopsies, improper sampling, improper preservation and transport, microscopic examination of tissues is still considered a very useful method to study the disease process in situ, thus enriching the medical knowledge [3]. Studies have reported a significant major and minor discrepancies between clinical and autopsy diagnoses [4]. Histopathological examination of autopsy samples of the lungs analysed has been presented in this study. This study describes the prevalence and pattern of lung diseases in medicolegal autopsies, confirmed by histopathological examination.

Methodology:

This non interventional, record based cross sectional study was carried out in the Department of Pathology over a period of one year from Feb 2021 to Feb 2022. All consecutive cases that underwent medicolegal autopsy during that period, irrespective of age and sex, were included in this study. Ethical clearance was not taken because of medicolegal nature of cases. A total of 161 cases of lung autopsy samples were received in the department. All these autopsies were performed by a forensic expert. Tissue bits from lungs were preserved in 10% formalin. These were then sent to our department along with history, clinical details and gross findings. We took 4 mm to 5 mm pieces from lung tissues in cassettes and after routine processing, paraffin embedding, blocks were prepared. All the histological sections were stained with Haematoxylin & Eosin stain and mounted. Ziehl-Neelson stain and Periodic Acid-Schiff (PAS) stain were also done, wherever required. They were then examined microscopically and findings were recorded. The findings could not be correlated with the gross findings as forensic expert did not provide gross details and sent only small portions of lung tissue.

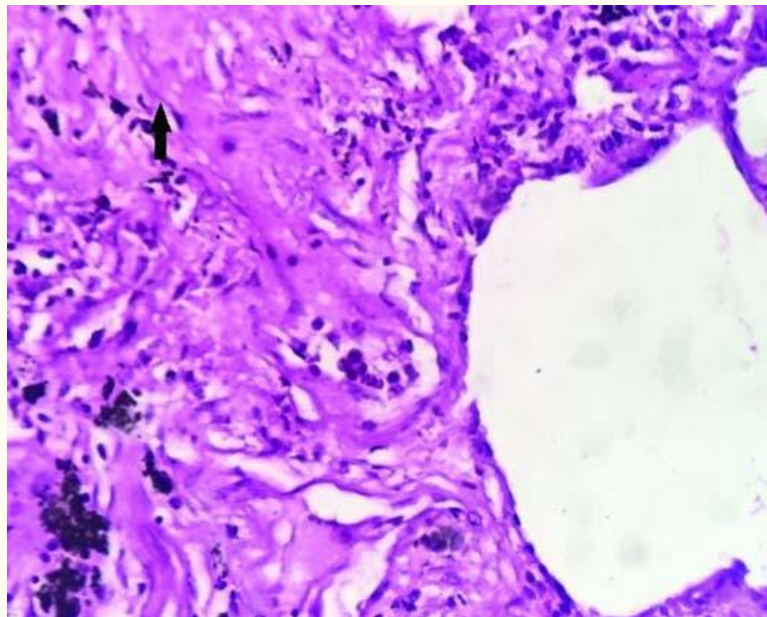
Results:

A total of 161 cases were received during the period of study along with relevant clinical details and autopsy findings. Histopathological examination was carried out in each case. Among them 71 had pneumonia, 21 had aspiration pneumonia, 18 had edema, 15 had congestion, 12 had TB, 8 had Interstitial lung disease, 5 Had Sickled RBCs/ Acute chest syndrome, 4 had emphysema, 3 had hyaline membrane disease with microthrombi (Covid 19), Cholesterol granuloma in 2 and malignancy in 2.



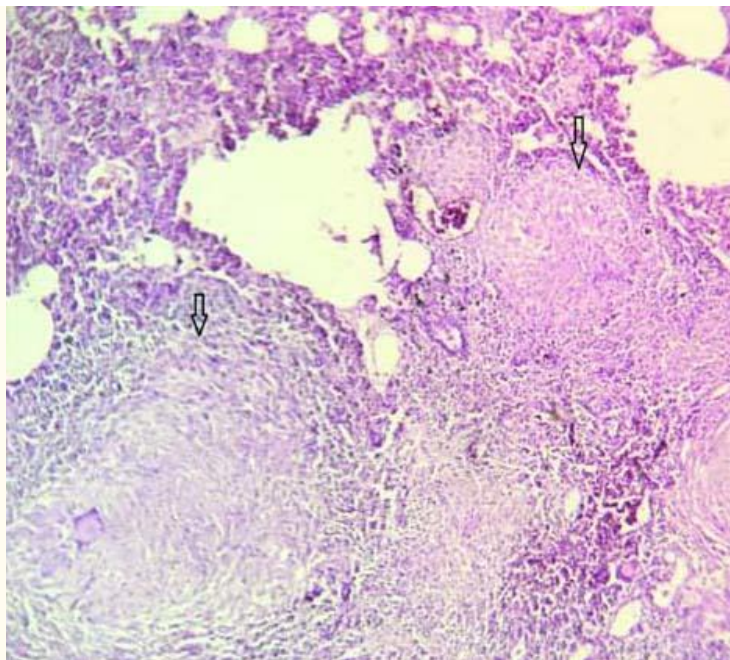
[Table/Fig-1]:

Oedema: pinkish fluid (arrow) present in alveolar spaces and septae (H&E 10X).

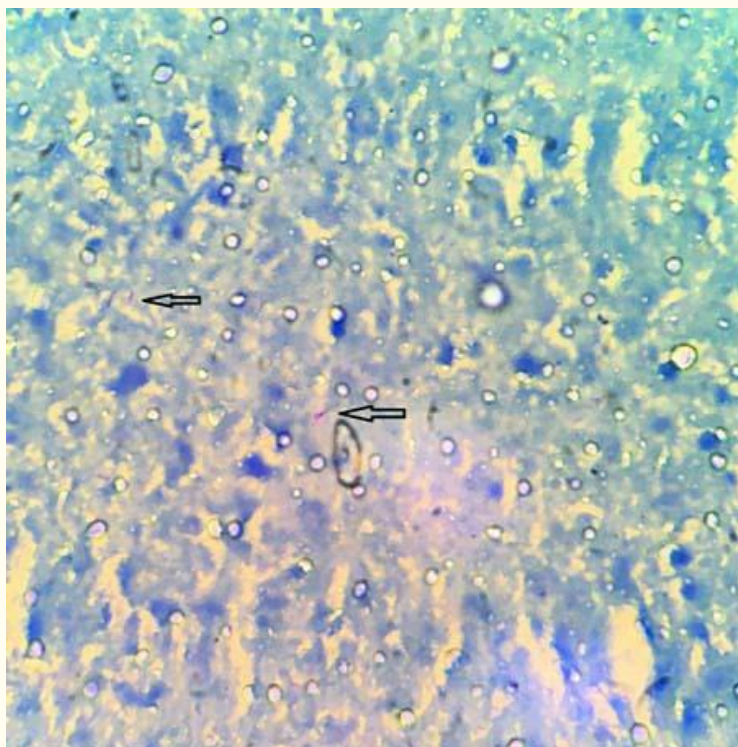


[Table/Fig-42]:

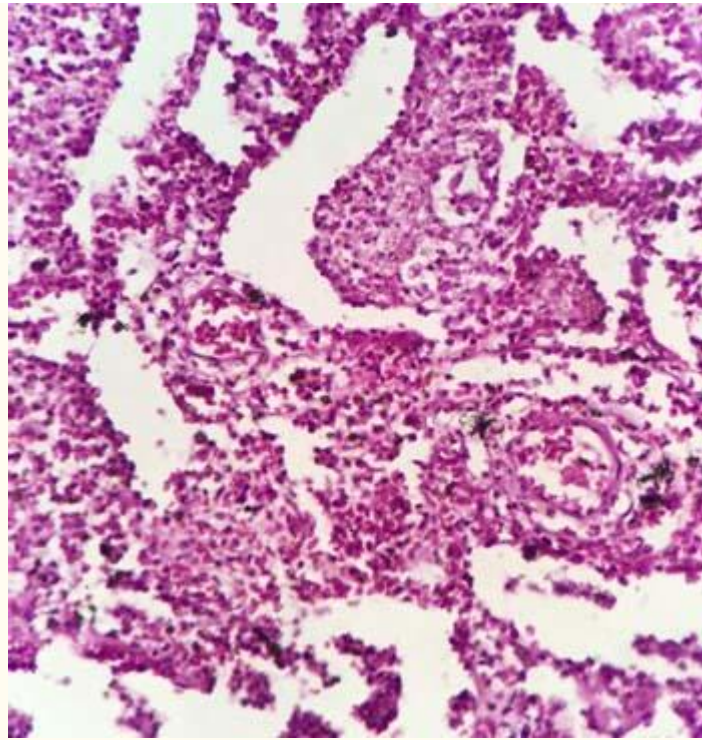
Changes in interstitium-interstitial fibrosis (arrow) in the interalveolar septae (H&E 40X).



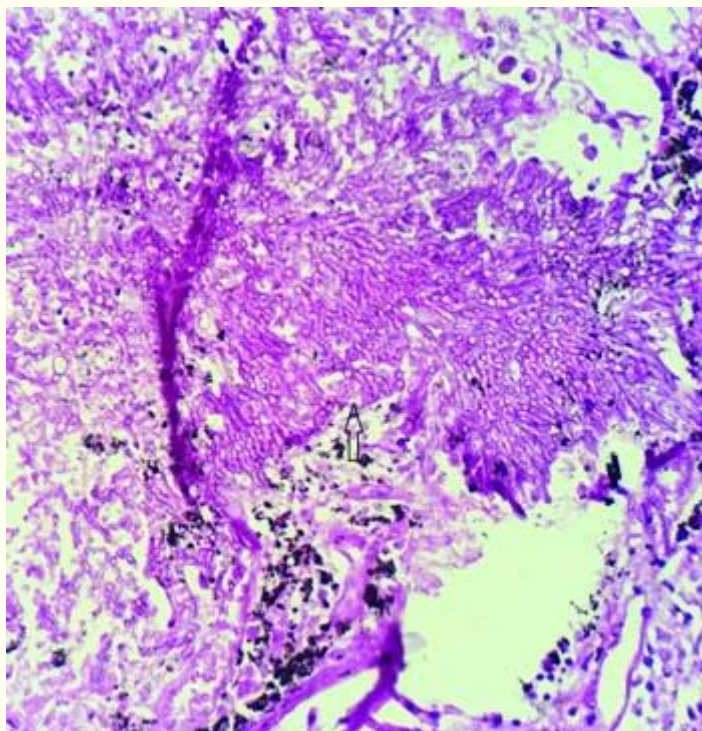
[Table/Fig-3]:
Coalescing epithelioid cell granuloma (arrow) (H&E 10X).



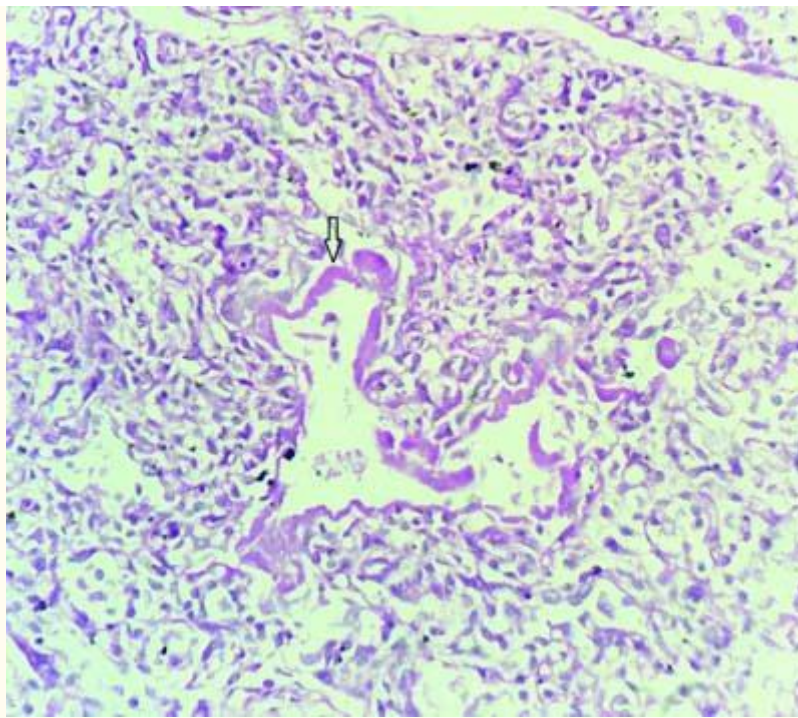
[Table/Fig-4]:
Microphotograph showing presence of acid fast bacilli (arrow) (ZN stain 100X).



[Table/Fig-5]:
Pneumonia- neutrophilic exudate into the alveoli (H&E 10X).



[Table/Fig-6]:
Fungal colonies of non-septate fungal hyphae branching at right angle (H&E 10X).
One case of hyaline membrane disease was seen in which section showed alveoli lined by eosinophilic hyaline membrane [6]. One case was of meconium aspiration syndrome which showed few squames within the alveoli [Figure 7].



[Table/Fig-6]:

Hyaline membrane disease: Alveolar wall lined by dense proteinaceous hyaline membrane (H&E 40X).

Discussion

Medicolegal autopsies are a mandatory legal requirement in unnatural deaths to assist the law. To perform a medicolegal autopsy, consent from relatives of the deceased is not required [1]. The facilities for medicolegal autopsies are available across all districts of our country [3]. The autopsy, if combined with relevant details and histopathological examination, is of great value in establishing reasons which led to death [1].

Kandy NC et al., quoted that even in the era of high-tech medicine the autopsy remains an important tool for quality assessment of clinical diagnoses [5]. As far as lungs are concerned, these were normal in only 9.80% of the total number of autopsies in their series. In our retrospective study of 161 cases, the autopsy samples of lungs were autolysed in four cases and those cases were excluded from the study. Among the rest 82 cases, in 26 cases (31.9%) histopathological findings were unremarkable. Eighteen among these 26 cases were adults between 16 to 45 years age group, signifying the healthy status of lungs in the adults. 56 cases (68.1%) had significant microscopic finding.

Bal MS et al., in their series of 150 cases had 19 autolysed sample and 11 cases with normal lung tissue [6]. Unlike their series we had much higher percentage of cases with no remarkable pathology. The very low number of autolysed samples in our series was probably due to availability of autopsy facilities in the hospital. There was male predominance in our series with males and females accounting for 59 (72%) and 23(28%) respectively. Similar sex distribution has also been observed by many other authors [7,8].

In our study, pneumonia was the most common finding in 71. This was 42.86% of the total lung cases with pathological changes. Similar observations were also observed by many authors in their series [8,9]. This could be a death related change or secondary involvement of lungs in all forms of terminal events due to cardiovascular causes. The second commonest finding was changes in interstitium in our series. It was seen in 10 cases (17.9%). Such changes could be due to pollution, smoking or any restrictive lung disease leading to fibrosis.

We had 4 cases of emphysema in our series of 161 cases. Among those five males, two were children and rest three were in age group of more than 46 years. All of these cases had urban background. Selvam V et al., reported 54 cases (50%) of emphysematous changes in the lungs in their series of 108 cases [8]. Their study had 61.1% and 38.9% cases with urban and rural background respectively. There were a very high percentage of labourers and farmers who had risk to toxic exposure (45.3%).

In this study, we came across 21 cases of Aspiration pneumonia. Two cases each were seen in children and young adults and one in middle aged male. Kandy NC et al., found 26.3% cases of pneumonia on histopathology of lung samples in their series of 51 cases [5]. Their study emphasized discordance in the diagnosis made on gross examination of lungs and final histopathological diagnosis at autopsy, particularly in cases of bronchopneumonia. Hunt CR et al., also had similar observations of discordance in the final diagnosis. However, we did not examine this aspect of findings in our study [10].

Caseous necrosis and epithelioid cell granulomas were seen in 12 cases, however only 12 were positive for AFB on ZN staining. Thus autopsy confirmed three cases having definitive diagnosis of pulmonary tuberculosis and another five with high probability of having pulmonary tuberculosis during their life time. Similar results were seen in studies conducted by Garg M, et al., [11]. In their study granulomatous inflammation was an incidental finding in majority of the cases (6 out of 8) not correlating with post mortem findings or history. This could have been due to ignorance on the part of doctors not investigating the possibility of tuberculosis despite suspicious symptomatology. Kandy NC et al., found tuberculous changes in lungs confirmed by histopathology in 15.78% cases in their series of 51 cases.

One case in our series where fungal colonies were seen was an incidental finding. Aseptate broad hyphae branching at right angles were present in that case. A study conducted by Uppin MS et al., also found broad non septate hyphal form in lung in only one case which they classified as zygomycetes species [12].

Retrospective study conducted by Sachdev S et al., 125 lung autopsy cases over a period of three years, also observed low prevalence of acute respiratory distress syndrome (3.15%) [13]. Other authors also reported low incidence rate of ARDS in lung autopsies [14]. Thomas S et al., in their prospective study on spectrum of respiratory distress in 1400 consecutive new-borns in North Indian population found that 116 cases developed respiratory distress [15]. Among these 116 cases, there were 10 cases of hyaline membrane disease and 14 cases of meconium aspiration syndrome. However, the post-mortem correlation could not be done as in many cases autopsy was refused. The study established that HMD was a disease of preterm (all 10 cases were preterm) and MAS was seen mostly in term babies (11 out of 14 cases were term babies).

Limitation

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

Conclusion

This study highlights various lesions in lungs which were either incidental or direct cause of death. The histopathological diagnosis on autopsy correlated well with clinical cause of death in our series.

Financial or other Competing Interests

None.

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