

ORIGINAL RESEARCH

To investigate the histopathology of the lungs and liver in cases of individuals who were brought dead to a tertiary care center

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ABSTRACT

Background: An autopsy is a medical technique that helps detect the physiological changes happening in the organs, therefore establishing the cause and time of death. Studying both the pre-death and post-death aspects of death is also beneficial. The significance of the research lies in its identification of the many types of abnormalities seen in the lungs and livers during medico-legal and neonatal autopsies, as well as via histological investigation. These abnormalities may have been either accidental findings or directly responsible for the cause of death. **Aim:** To investigate the histopathology of the lungs and liver in cases of individuals who were brought dead to a tertiary care center. **Material and methods:** Retrospective descriptive research was conducted at the Department of Forensic Medicine to analyze medico-legal autopsies. This research covered medico-legal autopsies conducted throughout that era, regardless of the age and gender of the individuals. Due to the medicolegal nature of the instances, ethical approval was not obtained. During the research period, a total of 50 medico-legal autopsies were performed. As part of these autopsies, samples of the lung and liver were submitted for pathological investigation. The whole specimen was sent to the department, conserved in a 10% formalin solution, accompanied with clinical particulars and macroscopic observations. The tissues underwent processing for histological testing. The histological sections were stained using Haematoxylin and Eosin stain and then inspected. **Results:** There are 37 males, which makes up 74% of the total, and 13 females, which makes up 26% of the total. The majority of the participants fell into the 20-30 age group, including 15 individuals (30%). This was followed by the 30-40 age group with 13 participants (26%), the 40-50 age group with 13 participants (26%), the below 20 age group with 5 participants (10%), and the over 50 age group with 4 people (8%). The majority of the specimens exhibit diffuse alveolar edema and congestion, accounting for 36% of the cases. This is followed by bronchopneumonia with numerous lung abscesses at 18%, bronchopneumonia at 16%, tubercular pneumonia at 14%, emphysema at 12%, and interstitial pneumonia at 4%. The majority of the specimens showed sinusoidal and vascular congestion, accounting for 48% of the cases. Cirrhosis was seen in 16% of the cases, chronic hepatitis in 12%, steatosis in 8%, CVC liver in 8%, epithelioid cell granuloma in 4%, and adenocarcinoma liver in 4%. **Conclusion:** This research emphasizes the significance of histological reports in lung and liver autopsy cases, particularly in instances when the histopathology results were unexpected and not taken into account at the time of death.

Keywords: Histopathology, lungs, liver, dead

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INTRODUCTION

Autopsy is a Greek term that refers to the act of visually examining something with one's own eyes. Forensic An autopsy is a specialized scientific examination of a deceased corpse conducted primarily to determine the identity, establish guilt, and ascertain

the cause of death [1]. By about 3000 BC, the practice of autopsy underwent development and advancement. During the process of mummification, the ancient Egyptians would extract and inspect the internal organs of deceased individuals. However, they attributed the alterations to magical causes rather than

pathological anatomy. The procedure is often referred to as an autopsy, however it is also known as Necropsy or Post-mortem [2].

An autopsy is a crucial and efficient technique for assessing the condition of key organs. Autopsy is a thorough examination conducted on a deceased body to investigate any illnesses or injuries that may be present and determine the cause and manner of death [3]. Autopsies may be categorized into two distinct types: forensic and clinical. Forensic autopsies are often performed in cases of suspected or medicolegal deaths. On the other hand, pathologists usually do the clinical or pathological autopsy in the hospital to ascertain the cause of death and analyze the medical intervention that resulted in death [4, 5]. Histopathological examination of tissues from various organs is often conducted after autopsy. Nevertheless, lungs remain the most frequently affected organs worldwide, and lung illness presents itself in many and intricate ways. Although there are advanced diagnostic tools available, practitioners often encounter difficulties in making accurate diagnoses. Avoidable chronic respiratory illnesses afflict millions of persons globally [6].

The importance of lung disease in the fields of clinical medicine and pathology cannot be exaggerated. The lungs are often involved in various inflammations, neoplastic conditions, and other illnesses. Additionally, they are also implicated in almost all forms of fatal events produced by cardiovascular factors [7]. Therefore, it is crucial to evaluate the primary cause of death in order to formulate preventative strategies. The liver is vulnerable to various metabolic, chemical, microbiological, and circulatory disruptions. In certain cases, when the illness is primary, it might be attributed to cardiac decompensation, intoxication, or infections outside the liver [8]. The most prevalent primary liver diseases are circulatory irregularities, alcoholic liver disorders, hepatic steatosis, and neoplasms. The majority of chronic liver diseases, particularly in advanced stages, do not exhibit evident clinical symptoms or signs. As a result, these conditions are either not diagnosed or are found by coincidence during regular health screenings, exams for unrelated illnesses, surgical procedures, or postmortem examinations [9].

Moreover, both the lung and the liver are susceptible to a multitude of diseases and are involved in several inflammatory, neoplastic, and other problems. Certain factors might result in the manifestation of symptoms. The majority of degenerative diseases do not show any clinical symptoms and are thus identified via autopsy and histological tests [10].

MATERIAL AND METHODS

Retrospective descriptive research was conducted at the Department of Forensic Medicine to analyze medico-legal autopsies. This research covered medico-legal autopsies conducted throughout that era, regardless of the age and gender of the individuals. Due to the medicolegal nature of the instances, ethical approval was not obtained. During the research period, a total of 50 medico-legal autopsies were performed. As part of these autopsy, samples of the lung and liver were submitted for pathological investigation. The whole specimen was sent to the department, conserved in a 10% formalin solution, accompanied with clinical particulars and macroscopic observations. The tissues underwent processing for histological testing. The histological sections were stained using Haematoxylin and Eosin stain and then inspected.

STATISTICAL ANALYSIS

Descriptive statistics were used for data analysis, and the data was inputted into a Microsoft Excel spreadsheet.

RESULTS

During the research period, a total of 50 lung specimens were received. A histopathological examination was conducted for each instance. Among them, 10 lung specimens were inadequately maintained and autolyzed. The distribution of gender and age is shown in Table 1. The majority of the samples were obtained from deceased males. There are 37 males, which makes up 74% of the total, and 13 females, which makes up 26% of the total. The majority of the participants fell into the 20-30 age group, including 15 individuals (30%). This was followed by the 30-40 age group with 13 participants (26%), the 40-50 age group with 13 participants (26%), the below 20 age group with 5 participants (10%), and the over 50 age group with 4 people (8%). Table 2 displays the pathological results of the liver specimen. The majority of the specimens exhibit diffuse alveolar edema and congestion, accounting for 36% of the cases. This is followed by bronchopneumonia with numerous lung abscesses at 18%, bronchopneumonia at 16%, tubercular pneumonia at 14%, emphysema at 12%, and interstitial pneumonia at 4%.

Table 3 displays the pathological results of the lung samples. The majority of the specimens showed sinusoidal and vascular congestion, accounting for 48% of the cases. Cirrhosis was seen in 16% of the cases, chronic hepatitis in 12%, steatosis in 8%, CVC liver in 8%, epithelioid cell granuloma in 4%, and adenocarcinoma liver in 4%.

Table 1: Gender and age of the participants

	Number =50	Percentage
Gender		
Male	37	74
Female	13	26

Age		
Below 20	5	10
20-30	15	30
30-40	13	26
40-50	13	26
Above 50	4	8

Table 2: Pathological findings of the liver specimen

Findings	Below 20 years	20-30 years	30-40 years	40-50 years	Above 50 years	Total	Percentage
Emphysema	-	-	3	3	-	6	12
Bronchopneumonia	-	5	-	3	-	8	16
Diffuse alveolar edema, congestion	3	8	5	2	-	18	36
Tubercular pneumonia	-	-	3	2	2	7	14
Bronchopneumonia with multiple lung abscess	2	2	-	3	2	9	18
Interstitial pneumonia	-	-	2	-	-	2	4
Total	5	15	13	13	4	50	100

Table 3: Pathological findings of the lung specimen

Findings	Below 20 years	20-30 years	30-40 years	40-50 years	Above 50 years	Total	Percentage
Sinusoidal and vascular congestion	5	9	4	4	2	24	48
Cirrhosis	-	-	3	3	2	8	16
Steatosis	-	-	2	2	-	4	8
Chronic hepatitis	-	2	2	2	-	6	12
CVCliver	-	2	2	-	-	4	8
Epithelioid cell granuloma	-	2	-	-	-	2	4
Adenocarcinoma liver	-	-	-	2	-	2	4
Total	5	15	13	13	4	50	100

DISCUSSION

Medicolegal autopsies are compulsory in cases of unnatural deaths to provide legal assistance. Obtaining agreement from the deceased's family is not necessary to conduct a medicolegal autopsy [1]. Medicolegal autopsy facilities are accessible in all parts of our nation [3]. The autopsy, when supplemented with pertinent facts and histological investigation, is very valuable in determining the causes that resulted in death [11].

The current investigation mostly included samples obtained from deceased males. There are 37 males, which accounts for 74% of the total, and 13 females, which accounts for 26% of the total. In their separate investigations, Khare P et al. and Bal MS et al. observed a higher prevalence of lung lesions in men compared to females, with male-to-female ratios of 2.7:1 and 4:1, respectively [12, 13].

The majority of the participants were in the age range of 20-30, accounting for 15 individuals or 30% of the total. This was followed by 13 individuals or 26% in the age range of 30-40, another 13 individuals or 26% in the age range of 40-50, 5 individuals or 10% below the age of 20, and 4 individuals or 8% over the age of 50. However, the research conducted by Khare P et al. primarily analyzed lung samples obtained from autopsy performed on people within the age range of 16 to 60 years [12]. The majority of the specimens

exhibit diffuse alveolar edema and congestion, accounting for 36% of the cases. This is followed by bronchopneumonia with numerous lung abscesses at 18%, bronchopneumonia at 16%, tubercular pneumonia at 14%, emphysema at 12%, and interstitial pneumonia at 4%. In a study conducted by Khare P et al., it was observed that congestion and edema were the most frequently observed findings in lung specimens during histopathological examination. This was followed by changes in the interstitium, inflammation (such as pneumonia, granuloma, and fungal infections), emphysematous change, acute respiratory distress syndrome, hyaline membrane disease, and meconium aspiration [12].

The incidence of diffuse alveolar edema and congestion, which was noticed by several authors in their case series, was found to be consistent with the findings of the current investigation. The current research observed tubercular pneumonia in 14% of the patients. In their investigation, Kandy NC et al. discovered tuberculous alterations in the lungs in 15.78% of the patients [16]. According to Patel S et al., they discovered that 3.46% of all the patients they studied had lung TB, and one of those instances also had involvement of another body part in addition to the lungs.

In this investigation, the majority of the specimens showed sinusoidal and vascular congestion,

accounting for 48% of the cases. Cirrhosis was seen in 16% of the cases, chronic hepatitis in 12%, steatosis in 8%, CVC liver in 8%, epithelioid cell granuloma in 4%, and adenocarcinoma liver in 4%. The research conducted by Bal MS et al., [13] found that fatty change liver (39%) was the most common kind of liver lesion seen. Additional pathological observations in the liver in his research included cirrhosis, congestion, hepatitis, and cancer. According to Devi M et al., cirrhosis was found to be the most prevalent liver condition, accounting for 25% of cases, followed by chronic hepatitis at 22% [15]. In their histological study of liver specimens, Alagarsamy J et al. observed fatty change, Chronic Venous Congestion (CVC), cirrhosis of the liver, neoplasia, and hepatitis associated with CVC. Tsokos M et al. conducted a study on 45 instances of unexpected death [19]. Cirrhosis was seen in all patients, according to the findings. Voinova LV shown that steatosis is mostly linked to alcohol use, whereas cirrhosis is predominantly connected with viral infections [20]. Hepatic steatosis was shown to be the most prevalent finding in many additional investigations [13, 21-23]. The present investigation demonstrated the presence of granulomatous hepatitis in two cases. In a research conducted by Soutoudehmanesh R et al., granulomatous hepatitis was seen in 0.2% of the patients [24].

CONCLUSION

This research emphasizes the significance of histological reports in lung and liver autopsy cases, particularly in instances when the histopathology results were unexpected and not taken into account at the time of death.

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