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ORIGINAL ARTICLE

Medicolegal Autopsy: Histopathological Examination of Medicolegal Autopsy Cases and Its Correlation with Causes of Death

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ABSTRACT

Objective: The aim of this study is to determine the histopathological examination of medicolegal autopsy cases and its correlation with causes of death.

Study Design: Retrospective/observational

Place and Duration: This study was conducted at department of Pathology, Khairpur Medical College Khairpur Mir's for duration of eight months from 15thMay, 2020 to 15thJanuary, 2021.

Methods: Hundred cases of both genders were presented in this study. Cases were aged between 15-75 years. Cases detailed demographics age, sex and body mass index were calculated after taking informed written consent from authorities. Autopsy laboratory was used to take medicolegal autopsies of enrolled cases. 10% formalin solution was used for histopathological examination of all the specimens. In the course of the post-mortem investigation we examined the histopathology results for five major organs, such as the brain, heart, lung, liver and kidneys and compared them with gross anatomical results. Complete data was analyzed by SPSS 24.0 version.

Results: 62 (62%) cases were males and 38 (38%) patients were females. Mean age of the participants were 30.52±13.17 years with mean BMI 24.52±16.21kg/m^2. Most of the participants 40 (40%) were aged between 25-35 years of age followed by 27 (27%) were aged between 36-45 years. Most of the participants 70 (70%) were from urban area and the rest were 30 (30%) from rural area. Instant death was the most common cause found in 35 (35%) cases, followed by traffic accidents 24 (24%) cases. Most frequent effected organs were lung 29%, heart 26%, liver 21% and brain 18%. In lungs pneumonia was the most common effected pathology among 20 (68.97%) and in heart atherosclerosis was the most common effected pathology among 21 (80.77%).

Conclusion: In medicolegal autopsy cases, histopathological analysis may be regarded as a useful method. The most common organ in these cases were the heart, liver and lungs. In certain cases, the histopathological exam of these bodies has been useful in identifying the cause of death. Often pathological results included pneumonia, atherosclerosis and congestion.

Keywords: Histopathology, Medicolegal, Cause of death, Autopsy

INTRODUCTION

The name "autopsy" comes from the ancient Greek word "autopsy" meaning "seeing for yourself," "autos" and "opsis" [1,2]. As a word autopsy means death's self-study. The disease and lesions that illustrate the cause and way the individual dies are evaluated by an effective way to remedy the condition of internal organs [3]. In the broadest context, a medical-legal autopsy provides a record that provides a basis for views in a clinical trial, filing, wrongful civil death, civil malpractice or the disciplinary hearing or compensation hearing for workers[4]. [4]. Medical autopsies are carried out upon request and with the consent of the next decedent's family and are often required to ascertain or measure the nature of an illness process[5]. In contrast, a forensic pathologist conducts medicolegal autopsies primarily for the purpose of determining the cause and method of death but also to documents trauma, diagnosis and communication of potential infectious diseases to the appropriate organizations, providing family information on possible inheritable diseases, informing family members and investigating agencies and testifying at the court.

The World Health Organization forecast that traffic deaths would become the world's sixth leading cause of deaths and the second leading factor behind the loss of handicap-adjusted lives by 2020[6,7]. Lung injuries, bronchopneumonia and undiagnosed chest infections were the leading causes of death in RTA autopsies[6]. Multifactorial respiratory dysfunction after burns where ARDS and inhalation lesions are the major[8] syndrome. Medicolegal cases of poisoning are sometimes suicidal and never accidental[9]. Different authors have stated the usefulness of histopathologic results in electrocution and poisoning in death[10-12], and other authors[13,14] feel that histopathologic exams are of no benefit when examining postmortem medicolegals. The studies by Gupta et al. [13] and Jani et al. [14] showed that histopathology examinations could be used in a more logical and not defensive manner. In 189 routine forensic cases Mollina et al[15] examined brain, heart and liver, kidney and lung and compared the results to the gross anatomical findings.

A histopathologic analysis in tissue of different organs is also accompanied by autopsy. If the tissue is not well conserved or the tissue is a non-representative sample, it is

always impossible to finalize the histopathological study. In spite of drawbacks such as delays in autopsying, incorrect sampling, incorrect preservation and transport, tissue screening is still considered a valuable way of investigating the disease process in situ and enhancing medical know-how[16]. There have been substantial and minor divergences among clinical and autopsy diagnoses recorded in studies[17]. The objective of this research was to assess the histopathological testing of medico-legal cases of autopsy.

MATERIAL AND METHODS

This Retrospective/observational study was conducted at department of Pathology, Khairpur Medical College Khairpur Mir's for duration of eight months from 15th May, 2020 to 15th January, 2021and consists of 100 patients. Participants detail demographics were recorded after taking written consent from the relatives of patients. Perinatal deaths, cases under 15 years and autolysed specimens were excluded from this study.

Cases were aged between 15-75 years. Autopsy laboratory was used to take medicolegal autopsies of enrolled cases. 10% formalin solution was used for histopathological examination of all the specimens. In the course of the post-mortem investigation we examined the histopathology results for five major organs, such as the brain, heart, lung and liver, kidneys and compared them with gross anatomical results. Categorical variables were assessed by frequency and percentage but descriptive variables werecalculated by standard deviation. Complete data was analyzed by SPSS 24.0 version.

RESULTS

62 (62%) cases were males and 38 (38%) patients were females. Mean age of the participants were 30.52±13.17 years with mean BMI 24.52±16.21kg/m^2. Most of the participants 40 (40%) were aged between 25-35 years of age followed by 27 (27%) were aged between 36-45 years. Most of the participants 70 (70%) were from urban area and the rest were 30 (30%) from rural area. According to socio-economic status 35 (35%) cases were from low, 45 (45%) cases were from middle and 20 (20%) were from high status. (table 1)

Table 1: Demographics details of enrolled cases

Variables	Frequency (n=100)	Percentage
Mean age	30.52±13.17	
Mean BMI	24.52±16.21kg	
Gender		
Male	62	62
Female	38	38
Age Distribution		
<25	8	8
25-35	40	40
36-45	27	27
>45	25	25
Residence		
Rural	30	30
Urban	70	70
Socio-economic status		
Low	35	35
Middle	45	45
High	20	20

Instant death was the most common cause found in 35 (35%) cases, followed by traffic accidents 24 (24%) cases, falling from the height in 15 (15%), target killing in 13 (13%), suicidal poisoned in 7 (7%) and 5 (5%) cases were others. (table 2)

Table 2: Causes of death among enrolled cases

Variables	Frequency	Percentage
Causes		
Instant death	35	35
RTA	24	24
Fall from height	15	15
Target kill	13	13
Poisoned	7	7
Others	6	6
Total	100	100

Most frequent effected organs were lung 29%, heart 26%, liver 21%, brain 18% and kidney 6%. In lungs pneumonia was the most common effected pathology among 20 (68.97%) and in heart atherosclerosis was the most common effected pathology among 21 (80.77%). (table 3)

Table 3: Histopathological findings and the organs involved

Variables	Frequency	Percentage
Lungs (29)		
Pneumonia	20	68.97
Congestion	5	17.24
Tuberculosis	4	13.8
Heart (26)		
Atherosclerosis	21	80.77
Myocardial Infarction	5	19.23
Liver (21)		
Cirrhosis	10	47.62
Congestion	5	23.81
Brain (18)		
Oedema	7	38.9
Congestion	4	22.22
Kidney (6)		
Acute Tubular-necrosis	2	33.33
Congestion	2	33.33

Based on histopathological results on the death cause, we found that 92 (92%) were causing death after the autopsy, while 8 (8%) were found without death. In 6 cases (6%), we discovered discrepancies after histopathology, while in 94 (94%) cases, there were no differences as to cause of death. (table 4)

Table 4: Outcomes of histopathology examination on the death cause

Variables	Frequency	Percentage
Death Cause		
Yes	92	92
No	8	8
Discrepancy		
Yes	6	6
No	94	94

DISCUSSION

Autopsy plays a key role in assessing cause and pattern of death in medical-legal deaths. Histopathological analysis for the accuracy of causes of death is very important. [18,19] This thesis has examined 100 cases of medico-legal autopsy and correlated them to histopathology. Sixty (60%) were men, and 40 (40%) were women. Majority 40 (40%) of cases were between 25 and 35 years and 27% were between 36 and 45 years of age. These findings were

close to many of the previous studies of medicine law, in which male cases are among the most common age group in cases of medicinal autopsy, in terms of 65%-95% compared to female cases and in the age group 20-40%. [20,21] Most of the participants 70 (70%) were from urban area and the rest were 30 (30%) from rural area. According to socio-economic status 35 (35%) cases were from low, 45 (45%) cases were from middle and 20 (20%) were from high status.

In our study instant death was the most common cause found in 35 (35%) cases, followed by traffic accidents 24 (24%) cases, falling from the height in 15 (15%), target killing in 13 (13%), poisoned by disease in 7 (7%) and 5 (5%) cases were others. A research by Adil et al identified the most frequent cause of sudden death in 15 cases of medical autopsy followed by gunshot, road accident and hanging. [24]

We have examined the histopathological results of five major viscera (brain, cardiac, lungs, liver or kidney) and compared them to gross anatomical results from the examination, which showed that in the majority of cases during histopathology, morbid anatomical characteristics found in visceras were observed. The most commonly diagnosed pathologies in the autopsy organs have been pneumonia, heart atherosclerosis, congestion, hepatic cirrhosis, and acute tubular necrosis. In 14 patients, 10 cases of breakout, 03 abcess, 62 cases of edema, 19 case lung abscess, 02 case lung abscess, 20 cases of liver cirrhosis were reported by Mukherjee etal [22]. The pulmonary edema and atherosclerosis have been confirmed to be the pathology most commonly observed in autopsy cases. [23]Adil et al showed that the general pathology for autopsy specimens was atherosclerosis, fatty liver and congestion. [24]

Pneumonia (68.97%), followed by congestion of 17.24% and TB of 13.8%, is among the most prevalent pathologies found in the lung[26], and atheroclerosis of 80.77%, followed by myocardiography 19.23% is the most common pathology seen in cardiovascular diseases. According to Nada Chettian Kandy et al. the most frequent incidental histopathological finding was aorta atherosclerosis[27].

In this study, we found that after autopsy, 92 (92%) had determined the cause of death, while 8 (8 percent) did not find cause of death. Following histopathological review, discrepancies were found in 6 (6%) cases while no discrepancies were found in 94 (94%) cases concerning death. These findings were comparable to the Pathak study in which 94.44% did not report discrepancies with the cause of death while only 5.56% found them. [25] In medico-legal autopsies, we concluded that histopathological analysis is very successful. The most common cause of death was sudden death. Lung, heart and liver were the most common organs involved. Often pathological results included pneumonia, atherosclerosis and congestion.

CONCLUSION

In medicolegal autopsy cases, historopathological analysis may be regarded as a useful method. The most common organ in these cases were the heart, liver and lungs. In certain cases, the histopathological exam of these bodies has been useful in identifying the cause of death. Often pathological results included pneumonia, atherosclerosis and congestion.

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