ORIGINAL ARTICLE

Retrospective Analysis of Histopathological and Microbiological Correlation of Autopsy Cases

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ABTRACT

Aim: To determine the histopathologicaland microbiological correlation of medicolegal autopsies with causes of death.
Study Design: Retrospective/observational
Place and Duration of Study: Department of Forensic Medicine, Govt. Khawaja Muhammad Safdar Medical College Sialkot and Department of Pathology, Islam Medical & Dental College, Sialkot from 1stDecember 2018 to 30thNovember 2019.
Methods: Seventy five medico-legal autopsies were carried out from Autopsy Laboratories, Govt. Khawaja Muhammad Safdar Medical College Sialkot and THQ Hospital Pasrur. Demographical details including age, sex, residence, causes of death were recorded after taking consent from the authorities.Histopathologicaland microbiological examination of the received organs was done.
Results: Forty eight(64%) were males and 27 (36%) were females. Majority of cases 28 (37.33%) were ages between 20 to 30 years. Sudden death was the most frequent cause of death in 24 (32%) followed by road traffic accident in 15 (20%) and gunshot in 10 (13.33%) cases. Lung, heart, liver, and brain were the most frequent effected organs. Pneumonia and atherosclerosiswere the frequent pathology findings.
Conclusion: Histopathological and microbiological examination is very effective and important for the medicolegal autopsy cases. Sudden death was the most common cause of death. The most common organs involved were lung, heart and liver.
Keywords: Medicolegal, Autopsy, Cause of death

INTRODUCTION

Autopsy is an important tool in medicolegal cases to identify the cause and manner of death[1]. Medicolegal cases such as sudden death, road traffic accident and assault involve organs which are prone to infections, inflammations, occupational and neoplastic diseases.[2,3] Hence, these organs may show incidental findings[4]. Histopathological examination is essential for evaluation of specimens and to correlate the cause of death[5].

Forensic histopathology is a very important branch of Forensic Medicine. It deals with the microscopic analysis of various changes at cellular/tissue level throwing light on cause of death, solving a crime mystery. It is microscopic study of tissues of the deceased. To be complete histopathologist, one has to be competent in handling microscopes and histo-techniques[6]. The utility of histopathological findings in death due to electrocution and poisoning has been reported by various authors[7,8] while the other author[9] believe that histopathological examination is not of much useful modality in cases of medicolegal postmortem examination. Gupta and Jani[10] have reported in their studies that histopathology examination in postmortem examination should be used in a manner which is more rational and not defensive. Patel et al[11] have reviewed brain, heart, and liver, kidney, and lung sections on 189 routine forensic cases and compared the results to the gross anatomic findings. They have also reported almost same conclusion in her study in which microscopic examination affected the cause of death in only 1 case out of 189 studied cases, while in no case the manner of death was affected by it. The present study was conducted aimed to determine the histopathological and microbiological examination of medico-legal autopsy cases.

MATERIALS AND METHODS

This retrospective/observational study was conducted at Department of Forensic Medicine, Govt. Khawaja Muhammad Safdar Medical College Sialkot and Department of Pathology, Islam Medical & Dental College, Sialkot from 1st December 2018 to 30th November 2019. A total of 75 medico-legal autopsy cases were collected from Autopsy Laboratories, Govt. Khawaja Muhammad Safdar Medical College Sialkot and THQ Hospital Pasrur. Demographical details including age, sex, residence, causes of death were recorded. Previously autopsied cases, police encounter deaths were excluded. Specimens from all the cases were preserved for histopathology examination in 10% formalin solution, which were sent to pathology department of same institute for further proceedings. We reviewed the histopathological findings of five major organs e.g. brain, heart, lungs, liver, kidneys and compared the results with gross anatomical findings observed during post-mortem examination. We tried to find out whether histopathological examination is affecting the cause of death and legal status of the case in any way or it can be avoided in routine autopsy examination. Microbiological examination was done to all the cases. The microbiological isolates were obtained from CSF, heart

blood, ascetic fluid, pleural and pericardial fluid and tracheal aspirates. All the data was analyzed by SPSS 24.

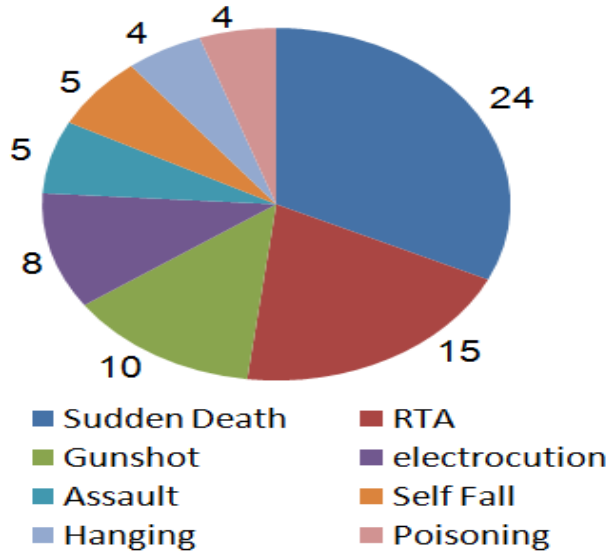
RESULTS

Forty eight (64%) were males and 27 (36%) were females. 5(6.67%) cases were ages <20 years. 28(37.33%) were ages between 20 to 30 years, 22(29.33%) were ages 31 to 40 years, 10(13.33%) had ages 41 to 50 years and 10 (13.33%) were ages above 50 years. 50(66.67%) cases were belongs to urban area while 25(33.33%) had rural residence. 26(34.67%) cases had low socio-economic status, 34(45.33%) had middle while 15(20%) had high socio-economic status (Table 1). Sudden death was the most frequent cause of death in 24(32%) followed by road traffic accident in 15(20%), gunshot in 10(13.33%), electrocution in 8(10.67%), 5(6.67%) had assault, 5(6.67%) had fall, hanging in 4(5.33%), poisoning in 4(5.33%) cases respectively (Fig. 1).

Table 1: Demographic information of all the autopsy cases

Variable	No.	%
Gender		
Male	48	64.0
Female	27	36.0
Age (years)		
<20	5	6.67
20 – 30	28	37.33
31 – 40	22	29.33
41 – 50	10	13.33
>50	10	13.33
Locality		
Urban	50	66.67
Rural	25	33.33
Socioeconomic status		
High	15	20.0
Middle	34	45.33
Low	26	334.67

Fig. 1: Causes of death



Lung was the most frequent organ in autopsy cases 20(26.67%) followed by heart 18(24%), liver 15(20%), brain 13(17.33%), Kidney 11(14.67), skin 11(14.67), spleen 10(13.33%), and uterus 4(5.33%) [Table 2]. In lung, pneumonia was the most frequent pathology finding in 15 cases followed by congestion in 4 cases and tuberculosis in 4 cases. Coronary atherosclerosis was the most frequent pathology of heart found in 14 cases, in liver cirrhosis found in 6 cases and congestion in 3 cases, in brain oedema in 5 cases and congestion in 2 cases, in kidney acute tubular necrosis in 5 and congestion in 3 cases, in skin congestion in 2 cases, dermis inflammation in 2 cases, in spleen congestion in 8 cases, in uterus endometrial stroma in 2 cases (Table 3). According to the microbiological examination bacterial causes found in 26 cases, fungal in 14 cases, viral in 16 cases, and mycobacterial in 2 cases (Table 4).

Table 2: Organs involved in the cases

Oran	No.	%
Lung	20	26.67
Heart	18	24.0
Liver	15	20.0
Brain	13	17.33
Kidney	11	14.67
Skin	11	14.67
Spleen	10	13.33
Uterus	4	5.33

Table 3: Histopathological findings of the organs

Organs	Histopathologicalexamination	No
Lung	Pneumonia	15
	Congestion	4
	Tuberculosis	4
Heart	Atherosclerosis	14
	Myocardial Infarction	5
	Vulvular Heart Disease	3
Liver	Cirrhosis	6
	Congestion	3
Brain	Oedema	5
	Congestion	2
Kidney	Acute Tubular-necrosis	5
	Congestion	3
Skin	Dermis Inflammation	2
	Congestion	2
Uterus	Endometrial Stroma	2
Spleen	Congestion	8

Table 4: Microbiological examination on cause of death

Isolates	No.	%
Bacterial	26	34.66
Fungal	14	18.67
Viral	16	21.33
Myco-bacterial	2	2.67
Unknown	18	24.0

Table 5: Effect of histopathological examination on the cause of death

Cause of Death	No.	%
After autopsy		
Found	68	90.67
Not found	7	9.33
After histopathological examination		
Discrepancy	3	4
No Discrepancy	72	96

According to the effect of histopathological findings on cause of death we found that after autopsy we determined the cause of death in 68 (90.67%) while in 7 (9.33%) cases

cause of death was not found. After histopathological examination we found discrepancy in 3 (4%) cases while no discrepancy in 72 (96%) cases regarding cause of death (Table 5).

DISCUSSION

In medicolegal deaths autopsy plays an important role to evaluate the causes and pattern of deaths. Histopathological examination is very essential to examine the accuracy of causes of death[12,13]. In present study 75 medico-legal autopsy cases were analyzed and correlate with histopathological examination. Forty eight (64%) were males and 27 (36%) were females. Majority of cases 28 (37.33%) were ages between 20 to 30 years followed by 29.33% cases were ages 31 to 40 years. These results showed similarity to many of previous studies regarding medicolegal cases in which male cases were high in numbers 65% to 95% as compared to females and age group 20 to 40 years was the most common age group of medicolegal autopsy cases[14,15].

In our study we found that sudden death was the most frequent cause of death in 24 (32%) followed by road traffic accident in 15(20%), gunshot in 10(13.33%), electrocution in 8(10.67%), 5(6.67%) had assault, 5(6.67%) had fall, hanging in (5.33%), poisoning in 4(5.33%) cases respectively. A study conducted by Adil et al[16] reported that sudden death was the most frequent cause among medico-legal autopsy cases in 15 cases followed by gunshot, road traffic accident and hanging.

In present study we found that lung was the most frequent organ in autopsy cases 20 (26.67%) followed by heart 18(24%), liver 15 (20%), brain 13(17.33%), kidney 11 (14.67), skin 11 (14.67), spleen 10 (13.33%), and uterus 4 (5.33%). A study conducted by Pathak[17] reported that in maximum cases the pathology was detected either in cardiovascular system (40% cases) or in Respiratory System (30% cases). Another study conducted by Jhajjet al[18] reported that cardiovascular system was the most commonly involved major system in 24.8% autopsy cases. Akarteet al[19] reported that Pneumonia was found to be leading cause of deaths in lung pathology which contributed to 74.7% cases.

In this study pneumonia, coronary atherosclerosis, congestion, liver cirrhosis, and acute tubular necrosis were the most frequently diagnosed pathology among organs received for autopsy. Mukherjee et al[20] reported that brain hemorrhage was seen in 14 patients, infarct in 10 cases, abscess in 03 cases, edema 62 cases, lung abscess in 2 cases and pneumonia 19 cases, lung abscess in 02 cases, liver cirrhosis in 20 cases. Gahineet al[21] reported that pulmonary edema and atherosclerosis were the most frequently found pathology in autopsy cases. Adilet al[16] demonstrated that atherosclerosis, fatty liver and congestion were the common pathology among autopsy specimens.

In our study we found that bacteria was the most common microbiological examination in 26 cases followed by fungal in 14 cases, viral in 16 cases, and mycobacterial in 2 cases. A study conducted by Bonds et al[22] reported that bacterial (53.4%), followed by viral (27.9%), fungal (16.4%), and mycobacterial (2.2%). Another study conducted by Ordiet al[23], bacterial pneuomonia and viral pneumonia were found in 13 cases and 4 cases.

In present study we found that after autopsy we determined the cause of death in 68 (90.67%) while in 7 (9.33%) cases cause of death was not found. After histopathological examination we found discrepancy in 3 (4%) cases while no discrepancy in 72 (96%) cases regarding cause of death. These results were similar to the study by Pathak[17] in which they reported no discrepancy regarding the cause of death in 94.44% while in only 5.56% cases it was found.

CONCLUSION

We concluded that histopathological and microbiological examination is very effective and important for the medico-legal autopsy cases. Sudden death was the most common cause of death. The most common organs involved were lung, heart and liver. Pneumonia, atherosclerosis and congestion were the frequent pathological findings.

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