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To Record Poisoning Related Changes In Liver Autopsy

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Abstract

Aim: To assess poisoning related changes in liver autopsy.
Materials & methods: A total of 50 cases of liver autopsy findings were recorded. A Performa was made and gross findings were recorded separately. Before starting of the study, ethical approval was obtained from institutional ethical committee. Each autopsy was treated as a special research project. Special morphological examinations of the viscera were routinely performed. All the results were recorded in Microsoft excel sheet and were analysed using SPSS software.
Results: In 40 percent of the cases, ethyl alcohol was the etiologic poisoning agent. Organochlorous and Carbamate were reported in 17 percent and 10 percent of the cases while Organ-phosphorous were responsible in 15 percent of the cases. On assessing the morphological findings, hepatic enlargement was seen in 5 percent of the cases while it was congested in 81 percent of the cases. On evaluating the histopathologic findings, fatty changes were seen in 51 percent of the patients while congestion was seen in 40 percent of the patients.
Conclusion: From the above results, the authors conclude that histopathological examination can support to estimate cause of death due to poisoning with fatty change being the most common findings.

Keywords: Poisoning, Liver, Autopsy

INTRODUCTION

Liver is vulnerable to a wide variety of metabolic, toxic, microbial and circulatory insults. In some instances, the disease is primary while in others the hepatic involvement is secondary to cardiac de-compensation, alcoholism or extrahepatic infections. Quite rightly liver is called as "the custodian of milieu interior". Autopsy study is useful to monitor the cause of death and to plan medical strategy.[1, 2] Autopsy of liver is very helpful in diagnosing silent liver diseases like steatosis, cirrhosis, chronic venous congestion, congenital lesions and malignant tumors. Majority of the chronic liver diseases may go unnoticed as may cause no clinical signs and symptoms. Liver diseases either may go undetected or not identified during health checkups or investigations required for other conditions or any surgery.[1- 3] Poisoning refers to exposure to any agent which is capable of producing an adverse response in a biological system. It may results into slight irritation, serious deleterious effects and even may cause death. Poisoning is common in the world including India but modes of poisoning varies i.e. it may results from the attempt of

suicide, homicide and accidents. High rate of accidental poisonings have been reported in children due to their inquisitiveness, inability to read warning labels, and inadequate supervision. At home, drugs or household chemicals are most likely the main cause of accidental exposure to children and adults.[4- 6] Hence; the present study was conducted for recording poisoning related changes in liver autopsy.

MATERIALS & METHODS

The present study was conducted for recording poisoning related changes in liver autopsy. A total of 50 cases of liver autopsy findings were recorded. A Performa was made and gross findings were recorded separately. Before starting of the study, ethical approval was obtained from institutional ethical committee. Complete history related to poisoning obtained from police, relatives or hospital records was obtained. Thorough external and internal post-mortem examination was performed and recorded. Each autopsy was treated as a special research project. Special morphological examinations of the viscera were routinely performed. All the results were recorded in Microsoft excel sheet and were analysed using SPSS software.

RESULTS

Mean age of the cases was 62.3 years. In 40 percent of the cases, ethyl alcohol was the etiologic poisoning agent. Organochlorous and Carbamate were reported in 17 percent and 10 percent of the cases while Organ-phosphorous were responsible in 15 percent of the cases. On assessing the morphological findings, hepatic enlargement was seen in 5 percent of the cases while it was congested in 81 percent of the cases. On evaluating the histopathologic findings, fatty changes were seen in 51 percent of the patients while congestion was seen in 40 percent of the patients. Centrilobular necrosis and sinusoidal dilatation was seen in 6 percent of the patients.

Table 1: Spectrum of various poisoning cases

Poison	**Number**	**Percentage**
Organ-phosphorous	15	15
Organochlorous	17	17
Carbamate	10	10
Ethyl alcohol	40	40
Other insecticides	18	18
Total	100	100

Table 2: Morphological findings

Gross findings	**Number**	**Percentage**
Enlarged	5	5
Reduced	6	6
Congested	81	81
Pale	5	5
Greasy	3	3

Table 2: Histopathologic findings

Histopathologic findings	**Number**	**Percentage**
Fatty changes	51	51
Congestion	40	40
Centrilobular necrosis	3	3
Sinusoidal dilatation	6	6

Total	100	100

DISCUSSION

Poison is a substance introduced in the body to produce ill- effect, disease or death. It may be of any origin like synthetic, mineral, animal or vegetable. It may be introduced through any route like mouth, nostril, anus, vagina, ears, eyes, or by injection or inhalation. Human poisoning can be accidental, suicidal or homicidal. The term insecticide is used to denote agents designed to kill only insects, but the term pesticide has a broader connotation and also includes herbicides, rodenticides, fumigants, nematocides, algaecides, ascaricides, molluscicides, disinfectants, defoliants and fungicides. Most of the poisonous elements undergo first pass metabolism in liver, causing number of changes. According to World Health Organization (WHO) reports 8 million people in the world consume poison every year. Out of which about 2,20,000 people die. About 50,000 deaths occur in India due poisoning every year.[7- 10]

It has been estimated that pesticides were directly or indirectly is responsible for more than 1 million illnesses worldwide annually, and this figure could be just the tip of the iceberg since most cases of poisoning actually go unreported, due to Inadequate Poison Information Centres, Forensic laboratories, and lack of knowledge in utilizing the pesticides, toxicological studies.[11, 12] Hence; the present study was conducted for recording poisoning related changes in liver autopsy.

Mean age of the cases was 62.3 years. In 40 percent of the cases, ethyl alcohol was the etiologic poisoning agent. Organochlorous and Carbamate were reported in 17 percent and 10 percent of the cases while Organ-phosphorous were responsible in 15 percent of the cases. On assessing the morphological findings, hepatic enlargement was seen in 5 percent of the cases while it was congested in 81 percent of the cases. In a similar study conducted by Sutay SS et al, authors assessed the pattern of histopathological changes of liver in poisoning. Out of total 140 autopsies 78 cases revealed histopathological finding in liver which varies with treatment, duration of survival, death autopsy interval. This may be helpful to conclude cause of death in obscure autopsies or even at each poisoning autopsy where opinion is reserved till viscera report is available.[10] Similar to our study, Hasan S et al recorded poisoning related changes in liver autopsy. Their study was conducted in 82 deaths due to agricultural poisons of both genders. During Autopsy detailed internal and external examinations were done and random portion of Liver were collected for histological examination and fixed in 10% formalin and stained with Hematoxylin and eosin and the findings recorded. Histological features were grouped based on degree of damage to hepatic tissue. Out of 82 patients, males were 50 and females were 32. Common poisons used was organophosphorus in 45 cases, aluminum and zinc phosphate in 13, pyrethrin compounds in 4 and unknown in 20 cases. The difference was significant ($P< 0.05$). Group I was seen in 48, group II in 26 and III in 8 cases. The difference was significant ($P< 0.05$).[11]

On evaluating the histopathologic findings, fatty changes were seen in 51 percent of the patients while congestion was seen in 40 percent of the patients. Centrilobular necrosis and sinusoidal dilatation was seen in 6 percent of the patients. Behera A et al, in another study reported incidental pathological findings on liver biopsy. The liver specimens collected from 64 cases were examined grossly as well as microscopically to establish the presence of liver diseases and also to find out the types of liver diseases. Out of 64 specimens, fatty change, chronic venous congestion, hepatitis, cirrhosis, Steatohepatitis, and drug toxicity cases are reported; fatty change being the predominant finding.[12] In a study conducted by Manish KN et al on pesticide poisoning, common microscopic finding were portal and sinusoidal congestion (60%), microvacoualization (52%), hydropic

degeneration (44%) and mononuclear infiltration (48%), micro & macro-vesicular steatosis (44%).[13] Sometimes liver may become fatty and friable in such cases. Fatty degeneration of parenchyma with enlargement of the liver has been observed in cocaine poisoning. The liver may be soft and doughy enlarged and may shows a soft, bright yellow or saffronic appearance from severe fatty degenerative changes in case of phosphorus poisoning. Chronic arsenic exposure may cause enlarged liver, advanced fatty changes. However, in acute exposure of arsenic may shows cloudy swelling, paleness with characteristic of fatty changes in the liver.[14]

CONCLUSION

From the above results, the authors conclude that histopathological examination can support to estimate cause of death due to poisoning with fatty change being the most common findings.

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