Descriptive Study of Copper Sulphate Poisoning A Study of Twenty Autopsy Case

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ABSTRACT

Acute poisoning constitutes one of the most frequent causes of emergency admission in our Hospital and forms important cause of death among young people. In this study the study sample consists of 20 cases of copper sulphate poisoning. As the salt is very cheap and easily available it has been used mostly as a self-poisoning substance by the people of lower strata and the reasons for self-poisoning are poverty and inability to solve personal problems

Key words: *poisoning, Copper sulphate.*

INTRODUCTION

In the present study the reasons for self-poisoning are poverty and inability to solve personal problems

Abstract: To know the route of administration, mode of action of copper sulphate poisoning viz the clinical pattern, target organs involved and its effect on various organs and to analyse the post-mortem findings and correlate it with histo-pathological features in target organs

MATERIALS AND METHODS

The statistics of autopsies done at the Institute of Forensic Medicine, Madras Medical College, Chennai during the year 2004-2005 are analysed with special reference to deaths of the of copper sulphate poisoning in this part of the country. Twenty fatal copper sulphate poisoning cases have been taken up for this study. These are the cases that were admitted and expired at the Government General Hospital Chennai with history of copper sulphate poisoning, for which autopsies were conducted at the Government General Hospital Mortuary, Chennai. The study is directed towards analysis of these twenty cases with reference to age, sex, occupation. Reason for consumption, mode of poisoning, time interval between consumption and admission, order of symptoms, target organs involved, investigations done, method of treatment, period of survival in hospital and cause of death. These materials are collected from the case records and inquest report from the police of the deceased.

DISCUSSION

Findings observed below are from those found in Twenty autopsies of copper sulphate poisoning done: Age; It varied from 18 to 55years and the average age was 32.9 years. SEX of the 20 Cases studied 18 were males and two were females.

RELIGION: 18 were Hindus and 2 were Muslims Marital Status. 14 persons were married and six were unmarried. OCCUPATION: 70% of them were labourers and 30% were jobless. An interesting finding is that all of them belonged to lower socio-economic strata. All of them belong to self-poisoning.16 persons have taken as a result of frustration due to personal problem like poverty and illnesses and two have taken due to family problems. All cases are from urban areas of south Madras and 80% are from Slum areas

Time Interval between Consumption and Admission: It varied from one to eight hours and majority of them were admitted after 2 hours AMOUNT CONSUMED. 100 gm in one case and 50 gm in two cases, as mentioned in their case records. In others the exact quantity and time is not known or the informations provided by the relatives were not reliable. The copper sulphate crystals were dissolved in water and swallowed and in two persons associated alcoholic intake was present.

In 85% of cases Renal complications occurred. In 65% of cases Hepatic complications occurred. In 30% of cases Gastro intestinal and Respiratory complications occurred. 15% cases associated with cardio vascular complications. Only 5% cases associated with Neurological complications.

Fig. 1: A case of copper sulphate poisoning showing yellowish discoloration of conjunctivae and pale palms 1

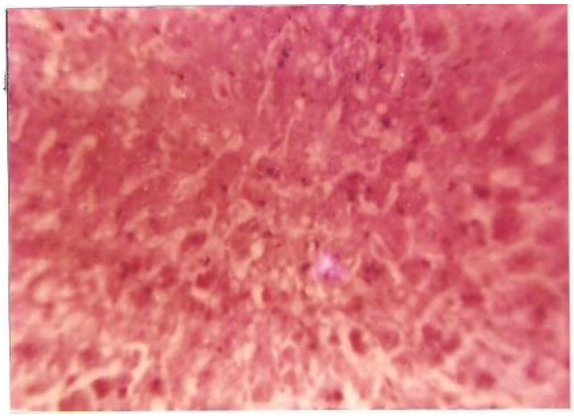

Fig. 2: High power view of Liver showing Greenish black pigments-Rubeanic acid stain 2

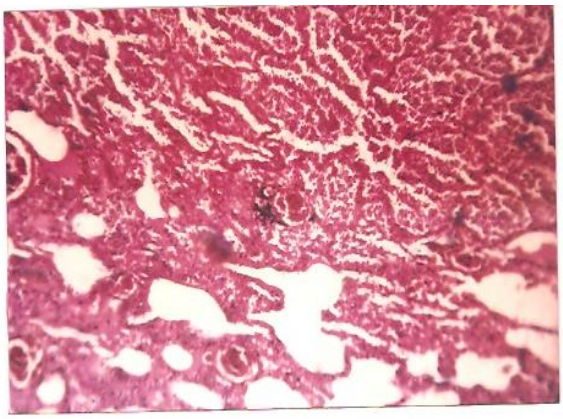

Fig. 3: Kidney showing Tubular necrosis with RBC casts and haemorrhages H&E stain-Low power view

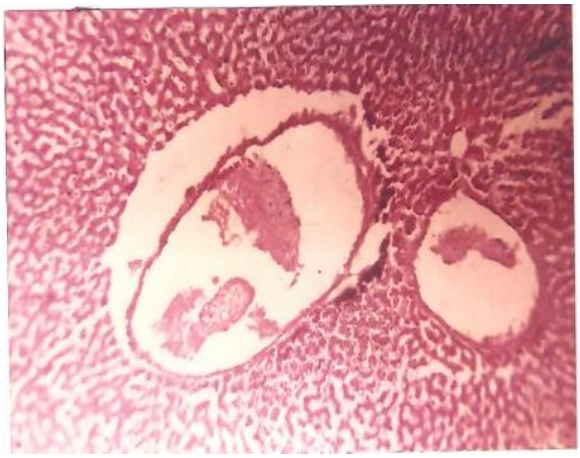

Fig. 4: Liver showing congestion and dilation of central veins and dilated sinusoids-Low power vie H&E Stain

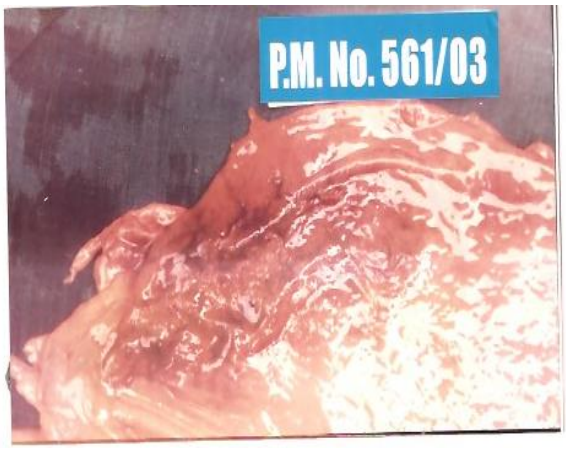

Fig. 5: Macrascopic appearence of Gastric mucosa showing congestion and ulceration

Fig. 6: Macroscopic appearence of kidney and cut section showing yellowish brown discoloration

Fig. 7: Macroscopic appearence of Lungs showing yellowish discoloration

CONCLUSION

1. Self poisoning by copper sulphate is one of the commonest poisons among the people of lower socio-economic group.
2. Men outnumber women in the incidence.
3. The commonest reason for self poisoning are unbearable physical illness followed by poverty. This is in contrast to what is found in worldwide literature wherein disappointment and dissatisfaction in life are the first and foremost factor.
4. No definite lethal dose can be determined.
5. Prognosis cannot be predicted by the presenting symptoms at the time of admission.
6. Circulatory collapse is the cause of death when it consumed within 24 hours of consumption and was found in 15% of cases. The cause of death when it occurred after 24 hours is due to severe renal failure in 15% of cases and due to involvement of multiple factors like acute tubular necrosis, haemolysis and myocarditis in 70% of cases
7. The overall mortality rate due to copper sulphate poisoning is 10%
8. The post-mortem findings and histopathological changes observed in the present study coincide with the observations made earlier

RECOMMENDATIONS

As copper sulphate is widely used as fungicide in agriculture and for greening of vegetables and canned foods, it has good access to poison the foodstuff. For most of the foreign substances in food, there is no sharp dividing line between what is undoubtedly harmless. Therefore until a substance is provided to be absolutely safe it is better kept out of food as far as humanly possible. The use of unprotected copper vessels in food preparation should be discouraged as its presence in food inhibits bacterial growth in the intestine interfering with digestion and metabolism. In other obvious causes of contamination are dealt with, the consumer will be adequately protected. Those concerned with administration of food and drugs Act must look in to this as to what amount of the element are reasonable and what are excessive and take necessary remedial measures

Management of poisoning cases will be better if easy and less cumbersome procedures are available to analyse the first gastric aspirate or vomitus especially in cases where the nature of poison is not known. It is suggested that to assess the prognosis of patients with acute copper sulphate poisoning, investigations like packed cell volume, blood urea, creatinine, serum bilirubin and blood copper sulphate level must be done in all cases at regular intervals. Routine electrocardiogram in all cases will be useful in diagnosing myocarditis. Early treatment with chelating agents will be useful in preventing haemolysis. In severe haemolysis blood transfusion will be useful, vigorous treatment with antacids and ulcer healing drugs may prevent haematemesis. Peritoneal dialysis instituted early well before renal failure sets in will go a long way in improving the prognosis of the cases.

In self-poisoning the various motivating factors behind the act must be studied and efforts must be made by the concerned to remove such problems from the society. Those who survive after self-poisoning should be referred to crisis intervention centres located in different parts of the country e.g. Madurai, Delhi,Bombay and Bangalore. Usefullness of these centres, is shown by the study of Venkoba Rao (1978)who found the ratio of completed suicide and attempted suicide improving from 1:8 to 1:80.

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