

Copper Sulphate Poisoning Mimicking Smothering: A Case Report with Review of Literature

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Abstract

Copper sulphate is an inhibitor of many enzymes. Its poisoning can cause death because of hemolysis, shock and renal failure. We present a case of a brought dead person where the external appearance of body was giving the picture of assault and smothering but after detailed external and internal examination the cause of death turned out to be copper sulphate poisoning. The authors intend to add to Medical literature this important presentation, which should be kept in consideration while examining cases of copper sulphate poisoning to prevent misinterpretation of external findings as traumatic injuries. One such wrong opinion by an autopsy surgeon can lead to harassment of an innocent person leading to miscarriage of justice.

Keywords: Copper Sulphate; Poisoning; Smothering.

Introduction

An autopsy surgeon should be well aware of the normal as well as abnormal presentations of the autopsy findings so as to interpret the injuries correctly. Interpretation of injuries is a confounding factor that can result in giving of incorrect opinion which can result in miscarriage of justice. To an inexperienced pathologist a lacerated wound over scalp can resemble an incised wound, distant gunshot wounds can be confused with drainage wounds, ant bites may be confused with antemortem abrasions, artificial bruise may be created by chemicals or poisons etc. Post mortem artefacts can resemble antemortem injuries for example undertakers fracture can occur because of mishandling of body [1]. Precautions should be taken while doing post-mortem examination in those cases where no reliable history is available and no

characteristic appearance is present. It is possible that the autopsy surgeon may misinterpret some findings as traumatic injuries. We present a case of a young adult male whose external post-mortem appearance gave the picture of assault and smothering, but after detailed external and internal examination, the case turned out to be a case of copper sulphate poisoning.

Case Report

A dead body of 29 year old man was found at his home. The case was then brought for post mortem examination at VMMC and Safdarjung Hospital, New Delhi. On post mortem examination, bluish discoloration over the face of the deceased was present at multiple places (Figure 1). It appeared that there were number of contusions present on the

face of deceased, leading to the suspicion of assault. The lower lip and tip of tongue also had bluish discoloration giving an appearance of smothering. (Figure 2) However on further dissection, no extravasation of blood was found in the underlying tissues. On internal examination, it was seen that



Fig. 1: Bluish discoloration mimicking contusion over right malar eminence with no extravasation in underlying tissue



Fig. 2: Bluish discoloration on inner aspect of lower lip and tongue mimicking smothering



Fig. 3: Bluish green powdery substance found in stomach with hemorrhagic stomach wall

there was bluish discoloration of tongue, esophagus and stomach wall, with powder like substance adherent to mucosa. About 200 ml of bluish green fluid was found in stomach of deceased with bluish material adherent to stomach wall (Figure 3). All internal organs were congested. Brain was congested and edematous. Rest of the findings were unremarkable. Toxicological analysis revealed the presence of copper sulphate.

Discussion

Copper is used in manufacture of insecticide and fungicide, as pigments, in making utensils and can be added in medicine [2]. Copper as a metal is not poisonous. In fact, it is an essential trace element with daily dietary requirement of 2 mg and normal body concentration of 50-150 mg [3]. The compounds of copper are poisonous. They copper sulphate is an irritant are powerful inhibitor of enzymes. Copper sulphate an irritant, a corrosive and causes hemolysis. Copper inhibits the enzyme glucose-6-phosphate dehydrogenase and glutathione resulting in intravascular haemolysis [4]. Copper ions inhibit the pyruvate dehydrogenase system causing liver damage [5,6]. Copper increases the permeability of cell membranes by inhibiting the sodium potassium ATPase pump [4]. It can also cause rhabdomyolysis by damaging skeletal muscle cells [7].

The symptoms of acute copper poisoning can start in 15-30 minutes. These include metallic taste, increased salivation, burning pain in stomach, thirst, eructations, repeated vomiting (bluish green), diarrhoea, oliguria, hematuria, albuminuria, acidosis and uraemia. It can also cause pancreatitis, coma, hepatic or renal failure. Subcutaneous administration of copper compounds can cause skin necrosis [1,2,7-11]. The normal reference range for serum copper in healthy adults is 0.7-1.6 microgm/mL [12]. The fatal dose of copper sulphate is 30 grams and of copper subacetate is 15 grams [1]. Sudden deaths are rare as death usually occurs in 1-3 days [7].

Copper sulphate poisoning though rare worldwide, is common in India [13]. Most cases are suicides but accidental deaths have also been reported [14-16]. Cases have been reported where children have consumed it because they became attracted to its colour or when the wound was irrigated with copper sulphate or as a complication of hemodialysis [17-19].

Gulliver JM reports a case of fatal copper sulphate poisoning where a girl child died within 2 hours of consumption of poison. She complained of stomach

pain and vomited blue coloured vomitus [12]. Chuttani et al in 1965, concluded that deaths occurring within 24 hours of copper poisoning is because of shock while that occurring at a later stage is because of renal or hepatic failure [14].

The postmortem findings in a case of copper poisoning are bluish or greenish discoloration of the gastric mucosa with congestion and erosion, which were typically present in our case [7,8]. The authors found it important to report this case because of the fact that deceased was found dead at his home with no history of consumption of copper sulphate poisoning or any other poisoning and was brought for autopsy with no lead whatsoever to the autopsy surgeon. If the bluish discolorations over the face would have been interpreted as contusion due to assault and smothering, the police would have been misguided into a totally wrong direction of investigation. The authors intend to add to Medical literature these abnormal findings in a case of copper sulphate poisoning to act as a reference for the autopsy surgeons.

Conclusion

Copper sulphate poisoning can give the appearance of multiple contusions over face, lips and tongue mimicking assault and smothering. Care should be taken by the autopsy surgeon while analysing such cases to avoid misinterpretation of the post mortem findings as their wrong opinion about the manner of death could lead to miscarriage of justice and harassment of an innocent person in investigation.

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