

A Case of Poisoning Due to Glutaraldehyde and Alprazolam Ingestion with Multiple Tentative Cuts Over Wrist and Neck

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ABSTRACT

Alprazolam is most commonly used benzodiazepine in overdose for deliberate self-poisoning. Glutaraldehyde is used for cold sterilization of medical, surgical and dental equipment. Poisoning due to accidental exposure as well as self-poisoning is common with glutaraldehyde. Self-inflicted or hesitational cuts are associated with suicide or attempted suicide or suicidal gestures and their examination is an important task for forensic expert.

Keywords: Alprazolam, Glutaraldehyde, Hesitational cuts, Incised wound.

INTRODUCTION

Alprazolam is triazolo analogue of the 1,4 benzodiazepines. It is mainly indicated as antidepressant and anxiolytic. It is also very effective in the treatment of panic attack, panic disorder and agoraphobia. Alprazolam is one of the most commonly prescribed benzodiazepines¹. Benzodiazepines are frequently for deliberate self-poisoning and responsible for roughly one third of all cases of deliberate self poisoning². Alprazolam is also most commonly used benzodiazepine in overdose³.

Glutaraldehyde (GA) is best disinfectant for cold sterilization of heat-sensitive medical,

surgical and dental equipment. It is found in products such as Endomax, Cidex, Omnicide Sporocidin, Matricide, Aldesen, Wavicide, Hospex and others. Glutaraldehyde is also used as a tissue fixative in pathology and histology labs. It is also used as a hardening agent in the development of x-rays⁴. Accidental acute exposure to GA is common in humans⁵.

Self-inflicted or hesitational cuts or tentative cuts are common among young generation. Injuries that are deliberately self-inflicted are common and their examination is an important task for forensic expert. These circumstances are associated with suicide or attempted suicide or suicidal gestures⁶.

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CASE REPORT

A 30 years old unmarried male, with history of previous suicidal attempt, came to our Medical emergency trauma centre (METC), King George's Medical University at 14 February, 2019 with conscious state, with alleged history of ingestion of 25 tablets of 0.25 mg alprazolam (Alprax) and 100 ml endomax (glutaraldehyde with activating substance) 3 hours before admission, with intention to commit suicide. Both the alprax and endomax are taken with in difference of 5 minutes.

Further, his family members gave history that patient had been suffering from psychiatric illness for which he had been on medication as advised by a psychiatrist. His medication includes alprazolam. Patient was dental technician and often used glutaraldehyde to disinfects dental equipment. As stated by patient, last night he was very emotional and under stress due to breakup of his long relationship with his love partner. His relationship was disturbed since last six months.

Local Injuries

1. A muscle deep incised wound of length 4 cm present at ventral aspect of wrist. Wound was 3 cm proximal to wrist joint. Direction of wound is lateral to medial
2. A muscles deep incised wound of length 4 cm was present 5 cm proximal and parallel to injury no.1
3. A muscles deep incised wound of length 4 cm was present 5 cm proximal and parallel to injury no.1. direction of wound wss lateral to medial. (Fig 1.)
4. An old incised wound, covered by scab was present 2 cm proximal to injury no. 3.
5. An incised wound of length 8 cm present at left front of neck. Its medial end was 4 cm below to chin and lateral was 7 cm below from left ear lobule. Direction of wound is lateral to medial.
6. An incised wound of 3 cm length was present 4 cm below thyroid cartilage



Fig. 1: Multiple hesitation cut over left wrist



Fig. 2: Multiple hesitation cuts at neck

in front of neck. Direction of wound is medial to lateral.

7. Below injury no.6 multiple old healed incised wounds. (Fig 2.)

General examination

Pallor, icterus and pedal oedema absent. Vitals of patient at time of admission were- blood pressure 114/70, pulse rate 90/min. Neurological examination-pupils were bilaterally contracted with sluggish reaction to light, diminished tendon reflexes and retention of urine. His Glasgow coma scale (GCS) was 15 (E₄V₅M₆). Respiratory system examination shows bilateral clear chest. Cardiovascular system (CVS) examination shows normal S₁S₂, tachycardia was noted, and ECG showed sinus tachycardia.

Routine haematological test shows raised TLC counts (30200), differential leucocyte count shows neutrophilia (92%) and lymphocytopenia (8%), mean corpuscular haemoglobin (34 pg) is slightly raised. Routine Biochemical tests were almost normal except slightly raised direct bilirubin.

Arterial blood gas analysis showed blood pH 7.341, pCO₂ 46.2, pO₂ 22.3, HCO₃⁻ 21.4,

anion gap 21.4, Na⁺ 138.3 mmol/L, K⁺ 3.48 mmol/L and Cl⁻ 96 mmol/L.

As suggested by the above finding, history from patient and family members probability diagnosis of alprazolam overdose and glutaraldehyde intoxication was made. A nasogastric tube was placed and bladder catheterization was done. Gastric lavage did not reveal any pill or pill fragments. Administration of parenteral fluids was done. Flumazenil, which is the antidote of alprazolam poisoning, was given. Rest of the treatment given to patient was symptomatic. Patient showed improvement within 12 hours. 0.25 mg tablets of alprazolam, as a part of prescription from a psychiatrist for treatment of his anxiety disorder, was already available to him. Since he was dental technician, glutaraldehyde as disinfectant (for dental equipment and X ray film) was easily available for him. Thereby, he attempted suicide with alprazolam tablets and glutaraldehyde solution and along with multiple tentative cuts over wrist and neck, out of frustration caused by his breakup from his love one. Since there was no neurological deficit, he was discharged after 48 hours. We advised the patient for psychiatric evaluation as well as counselling of his personal problems. We advised his family members to spend time with the patient and give moral support to patient to enable the patient to deal with life's challenges. We also advised family members to give prescribed medications to him under their personal vigilance.

DISCUSSION

Alprazolam, a triazolobenzodiazepine derivative has anxiolytic and antidepressant properties. It is very effective in the treatment of panic disorders, panic attack and agoraphobia⁷. Alprazolam is one of the intermediate-acting benzodiazepines, which is rapidly absorbed after ingestion⁸ and achieve its peak plasma concentration within 1-2 hours of ingestion⁹. Its elimination half-life is 6-26 hours⁷. Alprazolam is metabolized primarily by cytochrome P450 3A4 (CYP3A4), to two major metabolites

in the plasma: 4-hydroxyalprazolam and α hydroxyalprazolam. Alprazolam and its metabolites are excreted primarily in the urine¹⁰.

Higher toxicity of alprazolam overdose raises many questions about its increasing use and the population in which it is mainly prescribed. In 1991 alprazolam was approved for treatment of panic disorder^{11,12}. Now days over-prescription of alprazolam for panic attack, panic disorder and anxiety have been rising¹². About 85% of alprazolam indications were for panic disorder, mixed anxiety, depression, anxiety². People suffering from panic disorder are more prone to develop suicidal thought and suicidal attempt than in the general population therefore use of alprazolam in panic patient should be used in controlled way¹³. In our case, the patient was psychiatric and on alprazolam medication. He had taken overdose of alprazolam during his disturbed personal relation.

Reports of human exposure to glutaraldehyde is limited to a few individual cases and there are no reports of glutaraldehyde ingestion. This is unique case of glutaraldehyde ingestion

Glutaraldehyde (GA) is one of the best disinfectants for cold sterilization of medical and dental equipment. It is also used as a developer and fixer in X-ray film processing, as a fixative in histochemistry and electron microscopy⁵. The accepted glutaraldehyde air-concentration is 0.2 ppm¹⁴. Medical radiation technologists and endoscopy nurses, dental technician are more prone to develop sensitization of skin and respiratory organ. Chronic inhalation affects the nose and respiratory tract, and lesions become severe with prolonged duration of exposure¹⁵. Most frequent symptoms of glutaraldehyde vapour exposure include headache red eyes, cough and running nose. The incidence of contact dermatitis and bronchial asthma has also been reported¹⁴. Many adverse neurobehavioral effects, including anxiety, headache, dizziness, drowsiness, loss of attention, alteration of homeostatic reflexes, were observed at very high concentration of

glutaraldehyde in the operating theatre¹⁶. In our case patient was dental technician often uses glutaraldehyde for disinfection.

Tentative cuts are mainly seen on accessible parts of the body such as wrist, elbow and sometime over the neck. These injuries are usually superficial in nature. If a person is right-handed, tentative cuts is seen over the left side of the body, moving from left to right, with greater depth on the left and tailing off to the right side¹⁷.

CONCLUSION

Persons suffering from psychiatric illness like anxiety disorder, panic disorder, depression etc are more vulnerable to commit suicide. Very few mortalities are reported due alprazolam intoxication. Alprazolam, as a part of prescription from a psychiatrist for treatment psychotic illness, is easily available to such persons and this play major role for their suicidal attempts. Alprazolam intoxicated patient can be easily managed even non availability of its antidote. Literature available at internet play important role for its misuse. Easy availability of alprazolam at medical store is also a major contributor of its misuse. Misuse of alprazolam is prevented by control over distributor's end like medical stores and raising awareness of the people about the negative depiction of alprazolam being used for suicidal intent.

Glutaraldehyde is a skin, eye and respiratory tract irritant and skin and respiratory tract sensitizer. 2% solution of Glutaraldehyde is used as disinfectant. Even this concentration of glutaraldehyde produces moderate to severe irritation of the skin, wearing gloves (butyl rubber or nitrile rubber gloves) is essential to prevent hazards to the skin. Life-threatening laryngeal oedema may occur due to oropharyngeal injuries. Patients should carefully monitor for several hours after glutaraldehyde ingestion. Airways should keep patent and endotracheal intubation may requires.

Conflict of interest is - Nil.

Ethical Clearance: Not Required because my manuscript is a case report. and the case report doesn't require any ethical approval.

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