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CASE REPORT

Methanol Poisoning: A Report on 4 Cases in a Border State of North East India

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Abstract:

mass casualty which occurs after consumption of spurious liquor is usually called a 'hooch tragedy'. Methanol poisoning occurs very frequently in India and causes large number of casualties known as hooch tragedies. Though it happens in almost every part of India, the condition is being reported here as this is the first instance in a small border state in North East India without any precedence. Four people died after consuming locally brewed liquor and were autopsied in the mortuary of a tertiary health care centre in North East India. History revealed the typical symptoms of methanol poisoning and toxicological analysis confirmed the presence of methanol in the samples of blood and tissues. The cases are being reported here to serve as an eye opener for the people who have not encountered a hooch tragedy in this part of the country. Licensing of local brewery is absent in this small border state. Therefore, the quality control is almost nil which has in fact led to the present tragedy. Public health measures need to include steps to curb this menace in the bud. Legal statutes need to be strengthened regarding licensing, sale and trafficking of illicit liquor. Quality control is the need of the hour before it causes more deaths and hooch tragedies become a routine affair in this region. Good will from both the Government and the people are necessary for this.

Keywords: Local liquor; Incomplete distillation; Blindness; Death; Hooch tragedy; Methanol poisoning; Quality control.

Introduction:

Methanol is also known as methyl alcohol, wood alcohol, wood spirit and colonial spirit. It is a constituent in industrial solvents and in adulterated alcoholic beverages.[1] Ingestion causes severe toxicities. In December 2016; 78 people died in Russia due to a counterfeit body lotion which contained methanol.[2] During the COVID-19 pandemic, 300 people died in Iran believing that drinking methanol could help with the disease.[3] India has a thriving moonshine industry, and methanol-tainted batches have killed over 2,000 people in the last 3 decades.[4] Hooch tragedy claimed 93 lives in Mumbai in 1991. It happened in Gujarat where 136 people died in Ahmedabad after the consumption of hooch in July 2009. In 2011, a hooch tragedy in West Bengal claimed the lives of 172 people. It happened again in Mumbai in 2015 where 102 people died at a slum in Malvani, Mumbai after consumption of the poisonous alcohol. Consumption of poisonous alcohol led to the death of 13 people in Bihar in 2016. Presence of large quantities of methanol in the liquor was found to be the cause behind the deaths. In 2019, a Hooch tragedy claimed the lives of 99 people in Uttarakhand and Uttar Pradesh. In 2019, at least 114 people died after allegedly drinking spurious liquor in upper Assam districts of Golaghat and Jorhat.[4]

Surprisingly, the local brewery in this border state of north east India has never given rise to such tragedies before which has been reported either in the local media or in scientific journals. Therefore, the present cases are being reported here to spread awareness of this deadly health risk which is looming in the horizon.

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Case Reports:

Two years before the onset of Covid-19 pandemic, four daily wage earners went to a local vendor on the city outskirts for drinking and consumed locally brewed alcohol. All of them suffered from vomiting, blurred vision and unconsciousness after consumption of the alcohol as per the police reports. Following this, all of them died and their bodies were brought for autopsy in our centre.

Case No: 1 The first victim, a 48-yr old Meitei man, died at a private hospital 12 hours after the incident. PME revealed no external injuries except for congestion of organs. Stomach and small intestine contained about 60 ml of dark fluid with spiritous odour.

Case No: 2 The second victim, a 55-yr old, died at the same private hospital 5 hours after the incident. Similar symptoms were reported in this case. On PME, conjunctiva congested, cyanosis present. No external injuries seen. All internal organs congested.

Case No: 3 The third man, 51-yr old Meitei man with similar symptoms died at another private hospital 12 hours after the incident. On PME, marked cyanosis present; no external injuries seen. Internally, all organs were congested. Stomach cavity contained around 500 ml of straw- colored fluid.

Case No: 4 The fourth victim, a 49-yr old Meitei male died at his residence, 37 hours after complaining of similar symptoms. On PME, marked cyanosis was present; no external injuries were seen. All internal organs were congested. Stomach contained about 300 ml of brownish fluid.

Toxicological analysis in the first 3 cases detected ethyl alcohol, methyl alcohol and traces of metabolites in stomach contents, liver, kidney and blood. And in the 4th case, it was detected in the blood and tissue samples.

The sample of blood in the above cases contained 183.69mg%, 155.98mg%, 154.14mg % and 17.47mg% of methyl alcohol respectively.

Histopathological examination (HPE) in the 3rd and 4th cases revealed micro and macrovesicular steatosis and focal tubular necrosis.

Based on the postmortem findings and toxicological analysis and HPE reports, the deaths were due to methanol poisoning.

Discussion:

When multiple deaths occur after consuming contaminated liquor, it is known as hooch tragedy. The word 'Hooch" is derived from Abbreviation of hoochinoo, name of a specific liquor, from Tlingit Xutsnoowú K̲wáan, the group that produced it, from Hutsnuwu ("grizzly bear fort"), the name of the village on Admiralty Island in which they lived.[5] According to Webster's dictionary, Hooch means an alcoholic liquor especially when inferior or illicitly made or obtained.[6] Methanol is produced during the brewing process and concentrated by distillation. Commercial manufacturers reduce it to levels which are safe for human consumption. Unscrupulous backyard brewers may add industrially produced methanol to increase profits. Contaminating microbes can also produce methanol during traditional ethanol fermentation.[7,8]

Methanol poisoning is fairly common in our country usually involving a huge death toll[9]. The present incident involved four deaths which were autopsied in our centre. This may be due to the small scale nature of the home industry. Patients usually present with symptoms, 12-24 hours after ingestion of methanol. In the present series, onset of symptoms was much earlier resulting in a fatality within 5 hours in 1 case. This may be due to a higher amount of consumption or general physical morbidity. One of the most striking features of methanol poisoning is Snowfield vision (photobhobia and blurred and misty vision). Temporary or complete blindness due to optic neuritis and atrophy due to accumulation of formic acid within optic nerve. [10-12]

Some other commonly reported symptoms of methanol poisoning include gastrointestinal, visual disturbances and neurological symptoms.[11-12] Based on the history provided by accompanying people, all our cases had visual symptoms, followed by respiratory, gastrointestinal and cerebral symptoms which is usually found in methanol poisonings.[1,13,14] Methanol's toxicity is due to its metabolic products. The by-products of methanol metabolism cause an accumulation of acid in the blood (metabolic acidosis), blindness, and death. Death may occur from respiratory depression following metabolic acidosis. CNS depression is a minor factor.

The fatal dose is 60-120 ml and the fatal period is 24-36 hours or can be delayed for 2-4 days. Although both ethanol and fomepizole are effective, fomepizole is the preferred antidote for methanol poisoning.[1,13]

Indian law on Hooch: The directive principles of state policy (DPSP) in the Constitution of India (article 47) state that "....the State shall endeavor to bring about prohibition of the consumption except for medicinal purposes of intoxicating drinks and of drugs which are injurious to health".[15] Liquor regulations are a state subject in India, giving rise to wet and dry states. It breeds a complicated situation where licensing and excise regulations cannot be done clearly making it hard for firms to operate with transparency and very easy for corruption and criminality to seep in. This creates an opportunity for some people to make money by purchasing alcohol from dry states, and smuggling it into wet states at an inflated rate. It is possible to make hooch tragedies a thing of the past, if we can move beyond looking at alcohol policy as a matter of good and evil.

Experts have opined that there is a need to make an urgent shift to a public health paradigm in the approach to alcohol use. This would entail measures to reduce overall consumption — by raising minimum-age requirements, tightening enforcement of drunken driving laws, regulating retail and advertising. Along with this, Gov6rnments must target high-risk behaviours through the public health system.[17]

Conclusion:

Methanol poisoning may occur accidentally as a result of defective distillation of ethyl alcohol or adulteration to make more money. Ophthalmic, cerebral, pulmonary, and renal systems are commonly affected by methanol poisoning. Knowing the history, clinical features and the metabolic process will help in the prompt management of such cases. Further, autopsy, including histopathological examination and toxicological findings, can elicit the adverse effects of methanol on different organs. This will also assist the judiciary in providing justice to the sufferer, besides confirming the cause of death. Public must be educated and made aware of the consequences of consuming alcohol adulterated with methanol. Legal statutes need to be strengthened too. Quality control is a must. Good will from both the Government and the people are necessary for this.

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