G146 Fatal Sodium Nitrite Poisoning: A Case Report

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After attending this presentation, attendees will learn about acute intoxication deaths resulting from unusual chemicals, representing a challenge for investigators and pathologists in charge of determining cause of death.

This presentation will impact the forensic science community by showing that only a collaborative and multidisciplinary approach involving public health officials, forensic pathologists, and toxicologists can properly lead a comprehensive investigation.

Sodium nitrite poisoning, usually due to accidental food and water contamination, is rarely recorded in the literature. Sodium nitrite is a white to slightly yellowish crystalline powder that is very soluble in water. Its main use is for the industrial production of organo-nitrogen compounds, but it is also used as a food additive because it inhibits growth of pathogenic microorganisms and is used as a taste and color preservative for certain meats. It can be toxic in high amounts for humans because it causes methemoglobinemia. Sodium nitrite's LDLo is 33-250mg/Kg, meaning a 60kg person would likely have to consume at least 2g to 15g to result in death.

Presented is a case of "iatrogenic" sodium nitrite poisoning that occurred during a medical examination and malabsorption test for three patients, resulting in the death of one of them. Three women performed a Sorbitol H2 Breath Test to detect specific sugar malabsorption. Acute-onset symptoms, consistent with chemical poisoning, occurred within minutes after consuming 5g of sorbitol dissolved in a glass of water. Symptoms included asthenia, lost of consciousness, myoclonic jerks, nausea, and retching. The emergency was immediately recognized, but unfortunately, one of the women died a few minutes later despite all efforts and administration of methylene blue in an attempt to revert methemoglobin to hemoglobin. The other two women were transported to the nearest emergency department where methylene blue was promptly administered. The two patients were later discharged without clinical sequelae after hospitalization in the Intensive Care Unit. Samples of the presumed sorbitol powder that had been administered to the women were collected by authorities in the private medical clinic where the breath test had been performed. Investigations revealed that sorbitol had been bought online (international website) and that it was the first time it had been used in this clinic. During the autopsy, the external examination of the cadaver revealed diffuse cyanosis and resuscitation signs. Postmortem findings (organ gross examination and histological analysis) confirmed a normal cardio-respiratory system apart from the evidence of multiorgan congestion and pulmonary intra-alveolar hemorrhagic edema. The gastrointestinal apparatus showed acute congestive and focal hemorrhagic findings of the visceral wall related to the contact with poison. The majority of organs also showed a bluish discoloration due to the intravenous infusion of methylene blue as a result of the attempt at resuscitation. Extensive toxicology testing was performed to determine the cause of the poisoning and a list of potential agents was developed by forensic toxicologists. Infrared spectroscopy and gas chromatography revealed that all the sorbitol recovered in the clinic was actually sodium nitrite at a concentration of 97 – 98%. Analyses of urine and blood collected at the time of autopsy were performed using gas chromatography and test for nitrites and nitrates; the presence of high concentrations of sodium nitrite was confirmed. The serum nitrite ion level was 0.97mcg/ml and this level is consistent with death from nitrite poisoning (lethal level >0.55mcg/ml). The small concentration of nitrite in urine suggested the occurrence of rapid death.

The health risk of purchasing drugs from online websites that are not official drug resellers of well-known companies will be debated.

Sodium Nitrite, Sorbitol Breath Test, Toxicity

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