

Cyanide Poison

Gokul Shaji
Parul University

ABSTRACT: *As an agent intended to be deadly, cyanide has acquired a historical reputation. The usual sources of cyanide exposure in industry, chemistry labs, and fumigation have been increased in recent years by the growing usage of laetrile. The environment contains cyanide in huge amounts. It is recognised as a powerful chemical warfare, homicidal, genocidal, and suicidal agent. Though cellular respiration suppression is the primary mechanism of cyanide toxicity, there is also ample evidence of its more intricate poisonous manifestations. There are several antidotes for cyanide poisoning, such as sodium nitrate, sodium thiosulphate, and 4-dimethylaminophenol. Their security, efficiency, and appropriate recommendation for use are still unknown, though.*

Keywords:- *Lactic acidosis, bitter almond, oxygen and amyl nitrite, fire smoke: ECG, cardiac disorders, hydroxocobalamin.*

INTRODUCTION

Since the beginning, cyanide has been widely used as a poison. However, cyanide was not an efficient chemical warfare agent in World War I, probably due to ineffective distribution. Large amounts of cyanide can be fatal in a matter of minutes, and the dangerous substance is widely available. It is commonly used in industry and can be found in some foods and products of burning synthetic materials. Cyanides can be used and stored as solid salts or as liquids. There are adequate cyanogenic glycosides in the natural form of cyanide ions from plants, disregarding the fact that cyanides are released into the environment in a number of ways. Cyanide intoxication occurs by interacting with the haem form of cytochrome, the final enzymes in the respiratory electron transport chain, which slows oxidative metabolism and cell oxygen usage.

The cyanide ion's anoxic effect at the tissue level has been linked to the clinical signs.

REVIEW OF LITERATURE

1. One of the more rare poisons for which there are specific counteragents is cyanide. As a result, cytochrome oxidase activity has been entirely inhibited, resulting in anaerobic metabolism with

significantly decreased ATP synthesis and the formation of lactic acid. Patients who cannot demonstrate sufficient clinical response to supportive measures and antidotal treatment should be considered for hyperbaric oxygen.

2. Cyanide poisoning is a serious medical emergency that needs to be identified and treated right away. The common symptoms can include headache, dizziness, contusion, shortness of breath, nausea and vomiting, seizures, loss of consciousness. The physical examination includes respiratory distress, altered mental status. The treatment includes immediate intervention, antidotal therapy and supportive care. The important thing in cyanide poisoning relies on its rapid identification, immediate supportive care and prompt administration of antidotes.

3. In this investigation, which was carried out at the country's forensic service headquarters in Seoul, Korea, over a six-year period from 2005 to 2010, the incidence and features of cyanide poisoning deaths were examined. The objective was to overview the demographic and toxicological profiles so that to understand the trends and implication of forensic and public health practices. These studies mainly focused to improve the regulation and control of cyanide-containing substances and to give public-awareness about cyanide exposure. Forensic techniques are protocols helped in accurate detection and investigation of cyanide poisoning cases. Basically this survey was made to prevent and regulate cyanide poisoning.

4. Cyanide is one such fast acting toxin that is capable of causing fatal results within a few minutes of exposure. The laboratory methods are often accurate and time consuming in emergency situations. Therefore the need for rapid and field-portable analytical techniques. After a lot of research there were few techniques which was made for this diagnosis. The use of colorimetric assays, electrochemical sensors, ion-selective electrodes (ISEs), fluorescence based methods, portable gas chromatography, field deployable mass

spectrometry (MS) were the technique which made things way better. The use of choice of techniques was based on the situation, including the need for rapid results etc. The ability to diagnose cyanide exposure in critical circumstances has risen due to advancements in quick and portable analytical methods.

5. Using a rabbit model of sub-lethal cyanide toxicity, this study assesses the effectiveness of injectable cobinamide sulfite as an antidote. Cyanide poisoning poses a significant threat in both accidental and intentional exposures. The animals were exposed to a sub-lethal dose of cyanide to simulate mild to moderate poisoning. The dosage of cobinamide sulfite was determined based on preliminary toxicity and efficacy studies. Existing antidotes, such as hydroxocobalamin, have limitations in terms of administration and onset of action. Intramuscular cobinamide sulfite is a promising antidote for cyanide toxicity. To validate these results and investigate its possible application in humans, more research is necessary.

6. This study gives a detailed analysis of cardiac disorders such as types of arrhythmias, including cardiac arrest, blood pressure abnormalities, myocardial ischemia, lactic acidosis. Data were collected on patients demographics, clinical presentation, its treatments and cardiac outcomes. The treatment with hydroxocobalamin (sodium thiosulfate) played a crucial role in the outcome of the patients.

7. This paper made the study on the chemical properties of cyanide, its mechanism of toxicity, historical cases of its use in terrorism and its application on public health and security. As cyanide contains hydrogen cyanide gas, sodium cyanide, and potassium cyanide. The advantage of the cyanide is it can be inhaled, ingested and skin contact. Cellular respiration is inhibited by the cyanide's inhibition of cytochromic oxidase in the mitochondrial electron transport chain, which results in cellular hypoxia and the quick development of metabolic acidosis. It is used for mass harming because as it is easy to accessibility, its delivery methods and rapid lethality. It is used for its lethality, its case of acquisition, and potential for mass casualties.

8. This informs the challenges and emerging tools in managing the acute cyanide poisoning prehospital. There are a lot of difficulties faced in emergency medical service (EMS) providers and

introduction of new tools for the proper and effective prehospital case. Portable cyanide detectors and point-of care testing devices were introduced cyanokit and sodium thiosulfate is used as antidote, along with oxygen supplementation effective CPR in case of cardiac arrest. These quick and immediate responses to the cyanide poisoning will be better for the treatment of the victim or patient and decrease the case of death.

GROUP DISCUSSION

Exposure to cyanide, a very deadly substance that stops cells from using oxygen, can result in cyanide poisoning. Without oxygen, cells die, which can quickly lead to organ failure and death. It can happen through ingestion, inhalation or skin contact. Sources of cyanide. Natural sources, industrial sources. Symptoms can appear within minutes of exposure, especially with high doses making cyanide poisoning extremely dangerous.

Cyanide poisoning can cover several key areas such as its sources, mechanism symptoms, treatment and prevention.

CONCLUSION

Summarize key points, such as the importance of awareness prevention and rapid response.

Reinforce the role of education in preventing cyanide poisoning and ensuring safe handling practices. Cyanide poisoning can be fatal within minutes to hours if not treated promptly. Rapid administration of antidotes and supportive care can improve the chance of survival and recovery. Exposure can lead to long-term health issues.

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