CASE REPORT

IJETV Vol. 10, Issue 1, 2024 Print ISSN: 2394–6822 Online ISSN: 2395–4272

Case report of Homicide by inhalation of nitrogen gas: A Rare case

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Abstract

Nitrogen is physiologically an inert, nontoxic gas, not involved in human metabolism. It may displace oxygen from the inhaled air causing a life-threatening condition. Homicide by use of Nitrogen is a very rare case. We report on the analysis of a homicide of a 28-year-old female killed by her fiancé with 100% nitrogen gas as confessed by him before the police.

Keywords: Hypoxia, Inhalation, Nitrogen, Viscera.

Int J Eth Trauma Victimology (2024). DOI: 10.18099/ijetv.v10i01.10

Introduction

Nitrogen (N2) as a separate gas element was discovered in 1772 independently by D. Rutherford and H. Cavendish. Later, A. Lavoisier declared nitrogen as the principal component of Earth′s atmosphere. Nitrogen is physiologically an inert, nontoxic gas, not involved in human metabolism. It may displace oxygen from the inhaled air causing a life-threatening condition. Reduction in atmospheric oxygen to less than 25% of normal value can lead to rapid unconsciousness and death in minutes. In the medico-legal literature, there are few cases of suicide by inhalation of nitrogen described.[1]

The use of pure nitrogen gas to commit suicide has recently become more popular, although suicides involving nitrogen oxide fumes have been occasionally reported in the past. The cause of death in such cases is attributed to asphyxia due to forced depletion of oxygen, a subcategory of a phenomenon dubbed environmental hypoxia. A case of a 26-year-old man who committed suicide by inhaling nitrogen through a plastic bag is reported. The exact method of suicide used here is one of the many described in detail on the Web.[2] Suicide using a combination of a plastic bag over the head and inhalation of a nitrous oxide, also known as laughing gas, has a euphoric effect and is used as a non-irritating gas, such as helium, argon or nitrogen, has been reported in the literature. recreational inhalant drug that can be purchased legally. Deaths caused by recreational nitrous oxide abuse is rare but may occur if used in combination with a plastic bag over t he head.[3] In this paper, we report on the analysis of a homicide of a 28-year-old female killed by her fiancé by 100% nitrogen gas as confessed by him before the police.

Case History

A 28-year-old female dead body was exhumated from the bedroom of the accused from a pit of size 8 feet in depth, 3 feet in breadth and 5 feet in length. A sample of soil was taken from around the body. On arrival of the body in the mortuary body was wrapped in a white-red floral bed sheet, and transparent plastic sheet, smeared with mud and no clothes were present on the body, a board of three doctors was constituted for conducting the post-mortem examination. On examination dead body was discoloured showing features of decomposition with features of mummification on the front of the abdomen at places, facial features were partially identifiable, hairs were easily pluckable, and skin slippage at places. Teeth were loose in their sockets with ten teeth present in the upper jaw and fourteen teeth in the lower jaw present. Colliquative putrefaction is present in internal organs with soft tissues and tissues found soft, loose blackish coloured and jumbled up. peripheral cyanosis was present. Swabs were taken from the intravaginal and peri-vaginal area for spermatozoa testing / DNA testing In suspicion of sexual assault. Following injuries were present on the body: An abraded contusion of size 5 x 6 cm was present on the right side of the lower back, Multiple abraded contusions of size 1 x 1 cm to 5 x 3 cm over the whole of the face with the deformed left side of the jaw, on exploration fracture of the angle of the mandible of the left side with infiltration of blood in underlying soft tissue. Multiple abraded contusions of varying shape and size of 1 x 1 cm to 3 x 4 cm on the upper aspect of the right foot. All organs were congested.

Autopsy findings were suggestive of asphyxia but were otherwise negative. None of the organs showed path morphological alterations. Viscera was sent for chemical examination and Histopathological examination. Chemical examiner lab Punjab expressed their inability to detect nitrogen

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How to cite this article: Kaur T, Aggarwal AD, Walia DS, Chahal PS, Singh SP. Case report of Homicide by inhalation of nitrogen gas: A Rare case. Int J Eth Trauma Victimology. 2024;10(1):43-44.

Source of support: Nil

Conflict of interest: None

Received: 25/06/2024; **Received in revised form:** 28/06/2024;

Accepted: 29/06/2024; **Published:** 30/07/2024;

Figure 1: Showing tiny hemorrhagic foci on the pleura of both lung lobes

gas in the viscera as it is an inert gas. The blood sample of the alleged accused was taken for DNA matching. In the CSFL report, it was opined that no male DNA contribution was established in the vaginal swabs of the deceased, the Chemical examiner report showed no poison detected and there was no specific finding in the histopathological report of lungs due to autolytic changes happened due to decomposition (Figure 1). According to the circumstances of death, the autopsy findings and the results of clinical and post-mortem biochemistry the cause of death was asphyxia or oxygen deficiency. At last, we opined that the cause of death in this case was asphyxia due to a combination of suffocation and smothering. The accused confessed before the investigating agency that he purchased a nitrogen gas cylinder from the open market and gave the gas to a victim through a face mask by telling her that it would make her skin look fair. When pure nitrogen is inhaled loss of consciousness may occur suddenly. Furthermore, during the inhalation of nitrogen carbon dioxide can still be exhaled at the same time. So an increase in the process of respiration can only be caused by oxygen deficiency.

Discussion

Nitrogen does not cause irritant or warning symptoms. When the proportion of nitrogen in the air exceeds 88%, the respiration process is blocked resulting in asphyxia literature doing vast searches we are not able to find any case of homicide using nitrogen gas. Deaths caused by recreational nitrous oxide abuse are rare but reported.3 Cases of suicide with nitrogen gas inhalation are seen also.2 Reports related to asphyxiate gas inhalation toxicity in the literature are mainly associated with divers using scuba equipment.[4] Dorevitch et al reported fatal asphyxiation incidents of the construction workers in the United States between 1990 and 1999. toxic gas inhalation.[5] It was mentioned that nitrogen and argon were the most frequently encountered asphyxiate gases (10.3% and 4.6% respectively).[5] Nevertheless, execution by nitrogen asphyxiation is not used by any nation in the world. Suicidal nitrogen inhalation is an extremely rare event. There has been only one case published in the medico-legal literature.

Although nitrogen is considered to be non-toxic to humans, it does not support life and may rapidly lead to asphyxia (2-3 minutes) through the depletion and displacement of oxygen. Nitrogen is therefore a suffocating gas that results in depression of the central nervous system, similar to carbon dioxide.[6] Dinitrogen (N2) has been increasingly major challenge in forensic toxicology and circumstantial data has so far played a major role connected to suicidal deaths. The analysis of N2 in post-mortem cases still prepresent a challenge for the determination of the cause of death.[7] this case as this was not conducted

Conclusion

The presented case seems to be remarkable for several reasons:

- An unusual and curious way of nitrogen asphyxiation to commit homicide (full-face mask).
- The manner of the homicide indicates long-term planning and many other cases may open against the accused as his earlier wife also died under mysterious circumstances and post-mortem.

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