

Nitrogen–Plastic Bag Suicide

A Case Report

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Abstract: 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.

Key Words: nitrogen gas, plastic bag, suicide, Internet, environmental hypoxia

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Almost a million people globally commit suicide every year.¹ During the last 4½ decades, suicide rates have increased by 60% worldwide,¹ making the means of suicide a matter of great concern. Regardless of the motives, the medical history, or the profile of the person who commits or intends to commit suicide, a plethora of information on suicide methods can be accessed with a simple click of a computer mouse.^{2,3} Among the reported methods of suicide that commonly appears in Web searches is nitrogen (N₂) gas inhalation with the aid of a plastic bag.

Nitrogen has been frequently reported in accidental deaths in scuba diving, in industrial areas, in laboratories, during anesthesia, in a hospital during the installation of a magnetic resonance imaging system, and even in cases of atypical autoerotic asphyxia.^{4–10} In these cases, the N₂ used is either a pure or mixed gas, liquid N₂, or in vapor and nitrous oxide fumes.^{4–10} However, there exist only a handful of reports concerning the use of N₂ in suicide in the medicolegal literature.^{10,11}

CASE REPORT

The decedent was a 26-year-old white man who had studied dietetics for 3 years and then gave up his studies. He was living in a studio apartment under his parents' house and worked in his father's icon painting business. He had a younger brother, and his mother was a psychologist. According to his father, the decedent was a hardworking, consistent, intellectual young man, but also lonely and pessimistic. He was planning to become a graphic designer, and he was spending a lot of time on

the Internet. Lately, he had a new girlfriend, and he was getting along well with her. There was no history of drug or alcohol abuse, and apart from being a smoker, the decedent was healthy and medication-free. According to his father, there was no previous history of psychiatric disorder or suicide attempts.

The decedent was found in the afternoon on a warm day in August (temperature 293–301°K [19.85–27.85°C], north-northwest wind, $u = 8.1$ – 16.9 m/s), lying in a left lateral position on the floor in his studio apartment next to the bed. He had just returned from his village where he was on vacation alone, and none of the family members had had any contact with him. His father was concerned because of his absence and entered the flat using his own keys. The decedent was found dead wearing only black shorts, a green belt, and underwear.

Around his head and neck, there was a handmade “device” consisting of a plastic garbage bag, a shoe string that secured it around his neck, and a tube, also stabilized with tape, connecting the bag to a large cylinder of industrial N₂ gas next to the bed (Figs. 1 and 2). The plastic bag was torn by the decedent's father, who found the body. Upon close inspection, the house was neat and clean, while a half-filled cup of coffee was placed upon a piece of furniture above the television. A handwritten suicide note was found on the victim's desk, next to the computer. In his writings, the deceased reported his last wish to be cremated. The decedent had previously withdrawn all his money from his bank account, and it was found in his wallet. Two plastic bags with traces of rust were found in the garbage. They were used to transport the cylinder of N₂. There were no indications about when and from where the decedent obtained the cylinder. His computer was sequestered by the police for additional investigation of his late Web activity.

The external examination of body revealed the following: male body whose age agrees with the aforementioned 26 years old. Full rigor mortis was observed, whereas livor mortis was fixed and present at the posterior surface of the body. Body temperature was equal to that of the environment. There was extreme congestion and cyanosis of the face and fingers and also a greenish discoloration of the right lateral and anterior abdomen due to decomposition. Tardieu spots were present in the left shoulder area. As far as the internal examination of the body is concerned, there was visceral congestion, and the right and left lungs weighed 550 and 650 g, respectively. There was no evidence of trauma or any other pathological alteration except for mild lumen stenosis (<50%) of the proximal left anterior descending coronary artery. The histological examination of the organs revealed no pathological alteration. Toxicological analysis of the blood was negative for drugs and alcohol.

The cause of death was attributed to asphyxia due to the depletion of oxygen, and the manner of death was certified as suicide.

DISCUSSION

Deaths due to asphyxia can be divided into 3 categories: suffocation, strangulation, and chemical asphyxia, and all types

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FIGURE 1. The body at the scene of death and the makeshift structure used in suicide connected with a cylinder of N₂ gas.

are caused by the cells of the body being deprived of oxygen.¹² More specifically, during suffocations, oxygen cannot reach the blood. Deaths due to suffocating gases are not caused by the toxic nature of the gases, but as a result of atmospheric oxygen being displaced by them. This has been called environmental hypoxia.^{12,13} The most prevalent suffocating gases are carbon dioxide and methane, whereas recently helium and N₂ gas have become more popular.^{5,10,14–17} An asphyctic death due to argon inhalation is also reported in the literature.¹⁸

Furthermore, masks, plastic bags, “suicide bags,” helmets, and other handmade devices are used to accelerate death.^{10,13–16,19,20} Suicides by a combination of plastic bags and chloroform or diethyl ether suffocation are also described.^{19,21}

Determination of the cause of death in such cases is a difficult task mainly because of the lack of specific autopsy findings. Visceral congestion, petechiae, cyanosis, and fluidity of blood observed in asphyxia are nonspecific findings, given that they are also observed in other causes of death.¹² Moreover, toxicological analysis of the blood has little to offer because many of these gases are normal components of the blood. Consequently, the case history is vital for clarifying the cause of death. Two promising new methods of detecting suffocating gases are (a) sampling of the air combined with transthoracic aspiration at the scene¹⁴ and (b) a method of gas sampling from both lungs. This requires storing them in a plastic box that contains water and applying gas chromatography–mass spectrometry for gas analysis.²²

The depletion of oxygen through its replacement by other gases is fatal. Symptoms manifest progressively as fatigue, disability of skilled movements, nausea, complete inability to

move, unconsciousness, and other symptoms. Finally, death occurs when atmospheric oxygen comprises less than 6% of the air. The normal concentration of oxygen in the air is 21%.²³ Death then occurs in a matter of seconds or minutes,²³ although this depends not only on the concentration percentage of oxygen, but also on the rate at which it decreases. Consequently, asphyxia can be rapid (2–3 minutes) when there is no oxygen, prolonged (20–25 minutes) when oxygen is reduced gradually, and even more delayed (60 minutes) when the oxygen concentration remains at 20% but another harmful gas is present.²⁴

Nitrogen is a widely used gas in industry mainly because of its neutral properties that make it a suitable replacement for oxygen when oxidation must be avoided. It is usually stored in large cylinders. Importantly, it is a normal component of the atmosphere (78.09%).^{25,26} The first commonly described device for using N₂ as a mean of suicide has been named “The Exit International euthanasia device,” and it was invented by Dr Philip Nitschke²⁷ in 2007. It consists of a barbecue gas bottle filled with N₂ and a plastic suicide bag, which are connected by plastic tubing, tape, and a tie. This device is an improved version of the “exit bag plus helium” described in *The Peaceful Pill Handbook*.²⁸

Several organizations and sites in favor of suicide promote the use of N₂ focusing on the following “pros.”^{27,28} First, death induced by N₂ gas is fast. Most people will lose consciousness after 12 seconds and then die within minutes.²⁹ Besides, this method offers the prospect of a peaceful death because N₂ exists in the air. In that way, the intense hypercapnic alarm response caused by irritant fumes, such as carbon dioxide, is avoided. Moreover, the decedent’s reputation can remain intact, because once the suicide device is removed from the scene, no traces implying the manner of death remain. Regarding the equipment, it is easy to obtain without drawing suspicion because it is available from hardware stores and via the Internet as well.^{27,28} Moreover, N₂ may serve as a suicidal gas, but when released, being lighter than the air, it disperses quickly, and it is not fatal to anyone that may stand next to the body during recovery.^{27,28}

As the previous discussion has demonstrated, the Internet is often connected to suicide directly or indirectly, although its role is ambiguous.³⁰ On the one hand, the Internet can prevent suicide through supportive sites that establish an anonymous communication with health professionals or between individuals with similar problems. On the other hand, it can



FIGURE 2. A close view of the makeshift structure of suicide consisting of a plastic garbage bag (torn by decedent’s father), a shoe string, a tube, and tape.

facilitate an individual's attempt to commit suicide by offering the method (exact information), the means (medications, devices, substances, etc), and even the motivation/support to commit suicide occasionally (chat rooms, videotaped suicides, etc).^{31,32} According to a published study, adolescents, young adults, the mentally ill (eg, borderline personality disorder), and men run a higher risk of being influenced by suicidal Internet content than women.³¹ Risk factors include variable psychological aspects and traumatic life events in childhood or adulthood as well as family-related problems or psychological trauma.^{31,33} One should suspect suicide before it is committed, if the following warning signs are present: suicidal ideation, substance abuse, purposelessness, anxiety, hopelessness, withdrawal, anger, recklessness, and mood change.³⁴

In our case, the decedent was a young healthy male adult who was a smoker and preferred being alone, although he had recently begun a relationship. He did not face any work- or family-related problems. He also did not have any financial difficulties according to information from his relatives. Nonetheless, he used to state that “life is pointless” and “the world is corrupted,” but there had been no clear signs of his suicidal intentions. It is remarkable that the homemade device used by the decedent to inhale gas was identical to that described as a “suicide bag.”^{27,28} A picture of the so-called “suicide bag” can be easily accessed on the Web by the public.³⁵

Medicolegal examination of the body revealed no external or internal injuries. General findings similar to others found in deaths due to N₂ asphyxia were observed, including cyanosis and visceral congestion without other pathomorphological alteration, neither macroscopic nor microscopic. The cause and the manner of death were certified based on the evidence found at the scene (N₂ cylinder, plastic bag inhalation device, suicide note) and on the general nonspecific findings of asphyxia during autopsy.

In Greece, the case report described above is the first suicidal pure N₂ gas asphyxia to our knowledge. We report this case as an example of a new trend in suicide, influenced and promoted as untraceable by Internet, a fact that is alarming and raises serious concerns because 1 death every 40 seconds is due to suicide, globally.¹

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