

Case Report

“Detergent suicide” by adolescent as instructed by internet: A case report

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Introduction

A reported new suicide trend has been emerging in developed countries known as the “detergent suicides” and was first described in Japan in 2007 and then the technique became common in the United States and in other countries as well [1-4]. These suicides were dubbed “detergent suicides” by the media because they are carried out by mixing household chemicals (e.g., an acidic toilet bowl cleaner as a proton donor and insecticides or bath salts as a sulfur source) to produce toxic concentrations of hydrogen sulfide gas. The specifics of this technique became available on Japanese websites in late 2007. In September of 2011, the CDC’s Morbidity and Mortality Weekly Report (MMWR) published the finding of chemical suicides in automobiles in 6 states from 2006-2010. The only other published report of chemical suicides in the United States reported 75 chemical suicides during 1999-2010 [1]. Some anecdotal cases are also reported in the rest of the world. Quite recently, the case of a young woman found dead in her car in Australia was published. It has been supported that availability of information concerning that particular mode of suicide contributed to a dramatic increase in the number of these cases reported throughout the world [5].

The individuals remain in enclosed areas, such as a car or a closet. In most cases, victims lose consciousness with a single intake of breath and die immediately. This has been referred as a painless way to kill oneself [6]. Majority of the victims leave a warning note. Hydrogen sulfide is one of the major toxic gases in forensic practice. The toxicodynamic effect of hydrogen sulfide is similar to cyanides in that it binds to cytochrome C oxidase and is classified as a cellular asphyxiant [7].

We present the case of a 14-year-old girl who committed suicide by inhalation of intentionally generated gas, following instructions from Internet sites. The suicide was carried out by mixing strong acid (toilet bowl cleaner) with polysulfides (upholstery and alcantara cleaner) and the victim remained in an enclosed area (closet).

Case report

A young girl 14-year-old was found dead by her younger brother in the closet in her room. Aside the dead girl a bottle of toilet detergent containing hydrochloric acid and four bottles containing sulphurated lime solution were found. In the floor a yellow fluid was poured. According to her family and the officers reaching the place, a strong sweet smell existed all over the house. On the door of the house a note was left with advice against entering inside the house without protective equipment because of danger of hydrogen sulfide inhalation.

Discussion with the parents revealed that the girl was an excellent

student with high degrees in school and in foreign language. She had asked her parent to buy for her the above (among others) detergents in order to clean her room. They mentioned that they had removed from their previous residence two years ago and she seemed disappointed because she had lost her companies, but during the last year she seemed to have overcome her distress. However, a year ago, her mother discovered some stab injuries on her arms. The girl supported that she self-harmed in order to relieve her stress, but she was never examined by a psychiatrist or given medicine.

When examining the room, it was noticed that the walls were covered with several messages. In one of them, a gun was shown with the legend “Be a hero”. Searching her last communications via Internet, it was found that she had visited sites that gave information for suicide with hydrogen sulfide gas.

Gross and histopathological findings

The external examination of the body revealed several linear scars in the front area of her arms, due to old stab wounds. Recent stab wounds (aging 1-2 months) were also found in her upper leg. The macroscopical and histopathological examination of the heart revealed atrophy of the myocardial cells, indicative of reduced food intake (eating disorders). The lungs were congested with a little quantity of gastric content in the bronchus. The other organs were congested with no specific findings. The toxicological analysis of biological fluids was negative for medicinal drugs or drugs of abuse, alcohol and hydrogen sulfide. Based on the scene investigation the death was attributed to suicide by hydrogen sulfide inhalation.

Discussion

Hydrogen sulfide is recognized as an infrequent industrial colorless and hydro-soluble toxic gas with a “rotten egg” smell. It is often described as “rotten egg”, even at low concentrations (0.05 ppm). At higher levels of exposure, it has been described to have a sweet odor. Above 100 ppm, its warning odor is lost, because of olfactory nerve paralysis [6].

Hydrogen sulfide inhibits enzymes in mitochondria by binding with Fe^{3+} of cytochrome oxidase. This reaction blocks cellular respiration and interferes with oxygen utilization at the cellular level. Cyanogen

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compounds act the same way, and the toxicity is similar [8].

Since January 2008, there has been a burgeoning of suicide attempts using homemade hydrogen sulfide gas in Japan. By April 2008, the fad escalated into a chain reaction, and cases of hydrogen sulfide poisoning made headlines almost every day, nationwide. An introduction of new methods of making the gas, transmitted through message boards on the Internet, was blamed for this "outbreak." The new method entailed mixing bath additive and toilet detergent. The main component of the bath additive is lime sulfur, and toilet detergent acts as an oxidant to produce hydrogen sulfide gas. These suicides have been dubbed "detergent suicides" by the media because they are carried out by mixing household chemicals (often an acidic toilet bowl cleaner as a proton donor and insecticides or bath salts as a sulfur source) to produce toxic concentrations of hydrogen sulfide gas. The specifics of this technique became available on Japanese websites in late 2007. It is thought that availability of this information contributed to a dramatic increase in the number of these cases reported. In 2007, there were only 27 cases of hydrogen sulfide suicides in Japan; however, 517 cases were reported between January and July in 2008 [1,6].

Self-harm is a broad notion describing acts at the antipodes of self-care, as described by Claes and Vandereycken. Self-harm may be direct or indirect, may entail the intention to die (consequently referred to as suicide attempt) or not [9].

Use of the Internet by individuals to obtain instructions on how to complete a suicide has been a quite common phenomenon [6]. Editorials and discussions have focused on the existence of these sites and the information they provide. It seems likely that the frequency of hydrogen sulfide suicides is increasing as this method is popularized in media coverage of these deaths and more websites appear offering guidance on this issue. Media reporting of suicide and its fictional portrayal on television are known to influence suicidal behaviour, particularly the choice of method used [10]. Indeed, epidemics of suicides using particular methods have occurred after media portrayal of their use. The influence of the Internet on suicidal behaviour is less well understood, although it is an increasingly popular source of information, especially for adolescents and children, and concerns have been raised about the existence of sites that promote suicide [11].

The incidence of hydrogen sulfide suicides is underestimated

by public health officials and physicians, who should be aware of this disturbing trend in order to implement plans for prevention of morbidity and mortality due to intentional hydrogen sulfide gas exposure. Public health responders should be aware about these events to protect themselves when approaching a potential hydrogen sulfide victim and to educate others and to care for the rare survivor of the attempt. The Fire Department members must be alert not to enter any rooms where hydrogen sulfide gas was suspected to have been made. Closed rooms or cars proved to be extremely dangerous to enter in an attempt to save persons before paramedics arrived. Furthermore, the Police Agency must instruct internet providers to remove information that could be harmful [1].

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