

CASE REPORT

Helium Gas Inhalation as a Suicide Technique

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ABSTRACT

Helium gas inhalation for suicide is a relatively new technique and practically unheard of in Malaysia. The internet has helped spread this technique rapidly across the globe. We report a case of helium gas inhalation as a suicide attempt in Malaysia. Such a case offers a diagnostic challenge upon presentation. Simple techniques of ensuring adequate oxygenation can help in treatment of such cases

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INTRODUCTION

Suicide is a taboo subject in Malaysia. Shame and social stigma to families of suicides results in many people shying away from the topic. However, suicide is a genuine menace to Malaysian society. The prevalence of suicide in Malaysia is approximately 6-8 per 100,000 population per year (1). In Malaysia, the most commonly reported techniques were hanging at 56.6% and self-poisoning at 15.1% (2).

The advent of the age of the internet has made it easier for potential suicides to gain information, expand ideas and possible techniques. Social media has helped likeminded people find a platform to exchange ideas, discuss techniques and their lethality and offer solutions to problems faced during the attempt easily and anonymously.

CASE REPORT

Our patient, a 26-year-old gentleman, was noted not responding to calls while in the toilet and thus his father had to break the toilet door open. He was found unconscious in the toilet with a plastic bag taped over his face and a suspicious looking gas container beside him. His father had immediately removed the bag and delivered rescue breaths. The patient started to breathe spontaneously after a few rescue breaths and was brought

to the emergency department. Upon further history from his father, it was noted that there was no vomiting, no fecal or urinary incontinence and no seizures seen. The patient had no significant previous medical conditions and no history of suicide or psychiatric disorders. His father was unable to identify the contents of the gas in the container found beside him.

Vitals showed a blood pressure of 135/75mmHg, a heart rate of 95 beats per minute with sinus rhythm, an oxygen saturation (SpO_2) of 100% on room air, respiratory rate of 16 breaths per minute, and afebrile. His was only opening eyes to call, making unintelligible sounds and localizing to pain hence Glasgow coma scale was E3V2M5 and pupils 3mm equal and reactive bilaterally. There were no tremor, fasciculation or excessive sweating noted. Upon auscultation, his lungs were clear with good air entry bilaterally. His cardiovascular and abdominal examination was unremarkable. A quick neurological examination revealed power of at least 4/5 for all 4 limbs, normal reflexes and down going plantar reflexes bilaterally.

Initial investigations showed sinus rhythm on ECG, normal acidity of venous blood gas, normal blood cell counts and normal renal function and electrolytes. His bedside urine toxicology for sympathomimetics, ketamine, opioids and cannabis were negative as well. An attempt to obtain arterial blood gas was later abandoned as the patient had regained consciousness and was able to identify the offending inhaled gas.

Our patient was placed on a non-rebreathing mask as an attempt to flush out the offending gasses inhaled. His father was told to bring the gas container found beside him as soon as possible. He was placed on continuous blood pressure, heart rate, SpO_2 and cardiac monitoring.

Within 10 minutes, the patient had become alert and a history of helium gas inhalation with the intent to commit suicide was obtained. The content of the container was confirmed when his father brought the container to the emergency department 30 minutes later. The non-rebreathing mask was removed once the diagnosis was clinched. He was subsequently referred to the psychiatric department for attempted suicide by helium gas inhalation. Our patient was admitted to the psychiatric ward for suicide caution. He was started on oral clonazepam and a selective serotonin reuptake inhibitor. After one month of observation and counselling in the ward, he was discharged home to his parents.

DISCUSSION

Helium inhalation as a technique of suicide is relatively new. The idea was introduced in a right-to-die manual, *Final Exit: The Practicalities of Self-Deliverance and Assisted Suicide for the Dying*, a book published in 1992. The manual discussed planning and carrying out suicides to the advantages and disadvantages of a variety of techniques. From this foundation, the internet has exploded with various websites and chat groups specializing in suicide and specifically gas inhalation suicide. Our patient had stumbled upon the above mentioned book online while researching methods to commit suicide.

In a study in the UK where suicide by helium inhalation was analyzed, relatively few cases occurred during 2001/2002 at 5 deaths over 2 years to and huge increase to 89 cases by 2010/2011 (3). Closer to Malaysia, a paper from Hong Kong showed relatively small numbers of suicides by gassing. Only one sixth of all suicides were by gassing of various types including charcoal burning and helium. Helium gas inhalation as a technique of suicide only appeared in the year 2011, recording a single case. This number unfortunately increased to 11 suicides in the year 2013 (4). In Malaysia, no cases have been recorded as of mid-2016. The relative newness of helium gas inhalation as a technique of suicide may have influenced the rate of reporting. Helium inhalation is notoriously difficult to identify in a post mortem as it leaves no physical signs on the deceased.

Prompt identification and diagnosis can help the prognosis of these attempted suicides. History taking plays a major role in identifying helium gas inhalation. Directly obtaining an accurate history from the patient proved difficult in this case as he was not cooperative. It was only after many minutes did the patient began to respond to questions. It is important to remember that during the initial chaotic moments when the patient arrived with his family in tow and emergency personnel rapidly placing monitors and cannulas, the situation was not very conducive to obtain such delicate history

from the distressed patient. Witness accounts will help identify the technique used by simple description of the scene. Our patient was found locked in the toilet with a plastic bag over his head and a suspicious gas container beside him. By either the witnesses reading the labels or by bringing the tank to the emergency department, the diagnosis can be clinched. If the gas container is not labeled or is not produced to the treating team, accurate diagnosis becomes difficult.

Helium gas inhalation is notoriously difficult to diagnose via physical examination as it leaves no trace. Helium gas is a colorless and odorless gas thus making identification difficult. The technique used, where a plastic bag is placed over the head, the bottom part taped shut and helium gas piped into the bag leaves no physical marks on the external surfaces of the patient.

Finally, no specific laboratory test has been designed to identify helium gas inhalation as helium quickly disperses and does not accumulate in the blood or tissues. All blood parameters were normal in this patient, thus confounding the management team in the initial few minutes. By reverting to the basics of emergency medicine, securing and maintaining a patent airway, ensuring adequate breathing and a good circulation, the team had inadvertently started the appropriate treatment. The placement of the high flow mask with reservoir and one way valves ensured 100% oxygen delivery and displacement of any remaining helium gas in the lungs.

Possible complications of survivors of helium gas inhalation consist of effects of hypoxia. While mixtures of helium and oxygen have been extensively studied and shown to reduce airway resistance, pure helium gas merely displaces all available oxygen. Short durations of exposure to pure helium gas has no adverse effects. However if pure helium gas is inhaled for a prolonged duration, oxygen within the alveoli would be depleted causing hypoxia. Hypoxic ischemic encephalopathy may ensue leading to lifelong morbidity. Another possible complication, if helium gas is inhaled under pressure, is the risk of helium gas embolism. There has been a reported case where transient loss of consciousness and chest pain with ST elevations on ECG were seen after helium gas inhalation under high pressure. This leads to the conclusion that an embolism has occurred (5). The reported case was not a suicide attempt, merely a singer's attempt to change his voice.

CONCLUSION

Thus far, helium gas inhalation as a method of suicide seems to be becoming more popular. Proper and detailed history is needed to ensure an accurate diagnosis is made for the survivors that manage to arrive to the emergency department. Education of emergency response teams and emergency department personnel

in considering helium gas inhalation is needed. Early removal of the bag covering the face and use of 100% oxygen to rapidly clear the lungs of helium gas would reduce complications and improve outcomes.

REFERENCES

1. Armitage CP. Completed suicides and self-harm in Malaysia: A systematic review. *Gen Hosp Psychiatry*. 2015;37(2):153-165.
2. Bahar NI. Suicide among the youth in Malaysia: What do we know? *Asia Pac Psychiatry*. 2015;7(2):223-229.
3. Gunnell DC. Suicide by gases in England and Wales 2001–2011: Evidence of the emergence of new methods of suicide. *J Affect Disord*. 2015;170:190-195.
4. Chang SC. Suicide by gassing in Hong Kong 2005–2013: Emerging trends and characteristics of suicide by helium inhalation. *J Affect Disord*. 2016;192:162-166.
5. Tretjak MG. Cerebral and coronary gas embolism from the inhalation of pressurized helium. *Crit Care Med*. 2002;30(5):1156-1157.