

Space Oil and the Zombie Generation



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The vaping device, also known as an electronic cigarette (e-cigarette), electronic vaporiser (e-vaporiser) or electronic nicotine delivery system, was initially developed by a Chinese pharmacist, Hon Lik, in 2003 as a drug delivery device for conventional tobacco cigarette smokers.¹ The original intent was to create an alternative nicotine delivery device to aid with smoking cessation. Instead of combusting tobacco, e-cigarettes use batteries to heat liquid containing nicotine, which is atomised into an inhalable aerosol. Solvents such as propylene glycol and vegetable glycerin are required to keep nicotine in suspension.² The chemical contents within the liquid in e-cigarettes have been known to cause irritation to the lungs when inhaled, are potentially carcinogenic and can cause adverse effects to the cardiovascular system.³ It can also exacerbate underlying lung diseases such as asthma, causing a deterioration in control.⁴ E-cigarette or vaping-associated lung injury (EVALI) causes significant pulmonary infiltrates, leading to severe hypoxaemia and even death.⁵ The presence of tetrahydrocannabinol with vitamin E acetate has been reported to be the reason behind the clinical presentation.⁶ EVALI has also been reported in the use of exclusive nicotine-containing products, suggesting other potential contaminants that can lead to diffuse alveolar damage.³

The evolution of e-cigarettes

E-cigarettes have undergone rapid technological evolution since their introduction, resulting in four main generations of devices with distinct designs and user characteristics. First generation e-cigarettes were disposable products that mimicked the look and feel of conventional tobacco cigarettes. They were neither rechargeable nor refillable and were discarded once the battery or e-liquid was depleted. Second generation devices introduced reusable

systems with pre-filled or refillable cartridges that could contain nicotine, cannabis, flavouring agents, solvents or other substances. These cartridges were typically attached to a battery pen, with the components often sold separately.

Subsequent designs have offered greater customisation and versatility. Third generation e-cigarettes, commonly known as “tanks” or “mods”, are refillable and allow users to modify both the device settings and the type of e-liquid used. Fourth generation devices, or “pod mods”, integrate refillable or pre-filled pods into compact and modifiable systems, available in various shapes, sizes and colours. These pod-based systems frequently contain nicotine or cannabis, with or without flavouring additives. This classification of e-cigarette generations is based on descriptions provided by the US Centers for Disease Control and Prevention.⁷ The vape pens, box mods and pod-based devices are the most commonly used vaping devices in 2020.⁶ The biggest challenge society faces with e-cigarette devices is how easily the vape pods containing the e-liquid can be modified.

A closer look at etomidate

Etomidate (chemical name R-1-[1-ethylphenyl]imidazole-5-ethyl ester) was initially developed as an antifungal agent, but was found to have anaesthetic, sedative and amnestic effects by activating GABA_A receptors.^{8,9} For general anaesthesia, etomidate is administered intravenously in measured doses. The use of etomidate to induce anaesthesia has the advantage of not inducing significant hypotension as well as causing minimal changes in heart rate. It is an ultra-short-acting (dose dependent: two to three minutes [0.15 mg/kg dose]; three to five minutes [0.3 mg/kg dose]) nonbarbiturate general anaesthetic used for rapid induction of anaesthesia with an onset of action of 30 to 60 seconds and a peak effect in one minute.⁸

The offending agent and the dangers that lurk within

Intravenous abuse of etomidate is not a new phenomenon and has been reported in the medical literature.¹⁰ Vapes are also becoming laced with etomidate and are marketed as “space oil” in Hong Kong and known as “Kpods” in Singapore.¹¹ Etomidate has demonstrated rewarding and reinforcing effects in male rodents, which are also seen in humans.⁹ Because etomidate was never developed for administration via the inhalational route, the extent of its pulmonary absorption has not been systematically studied. Intravenous use is known to suppress adrenal steroid synthesis which may lead to profound hypotension, especially in critically ill patients.⁸ As for adrenal suppression through the inhalation of etomidate, three cases have been reported in Hong Kong with patients between the ages of 15 and 17.¹² Reported symptoms include altered sensorium progressing to psychosis, hyperactivity and insomnia. Other serious adverse effects associated with abuse include nausea, vomiting, hypokalaemia, myoclonus, hypoxaemia and, in severe cases, death.^{10,11} Vigilance is required as there is a potential for the addition of other dangerous drugs to the Kpods, such as cocaine and methamphetamine.¹²

Substance abuse through inhalation to achieve intoxication is also not a new phenomenon. Volatile substances such as contact adhesives, toluene, petrol and volatile hydrocarbons have been used illicitly to achieve euphoria with detrimental effects for many years.^{13,14} Inhalation of such substances has been associated with severe organ damage and has been the cause of premature death in youths. Vape devices have also been used as conduits to deliver poisonous substances such as ketamine, a dissociative anaesthetic agent used for induction, pain relief and treating depression. Chronic inhalation of ketamine has been shown to cause mania, hallucinations and severe encephalopathy.^{15,16}

The vape device's ease of use also allows drugs like cannabis to be introduced into e-liquids that often already contain nicotine. The dual use of such substances has been cited as a gateway to harder drugs, long-term addiction and dependence on illicit substances.¹⁷ Certain vape devices contain nicotine in the form of benzoate salt, allowing high levels of nicotine delivery.¹⁸ Newer disposable devices with a 10 mL well of 5% nicotine (500 to 600 mg/device) e-liquid can deliver the nicotine equivalent of more than ten packs of cigarettes and can be modified to vary the level of nicotine delivery.¹⁹

The law in Singapore

Since 1 September 2025, etomidate and its analogues have been classified as Class C controlled drugs under the Misuse of Drugs Act. Individuals found to have used e-vaporisers containing etomidate are subject to graduated penalties based on the number of offences. First-time adult offenders may face a fine of up to SGD 700 (SGD 500 for individuals below 18 years of age) and up to six months of rehabilitation. Second-time

offenders are placed under mandatory supervision, which includes drug testing and rehabilitation for six months. Repeat offenders (third or subsequent offences) are liable to a 12-month regime of detainment at a Drug Rehabilitation Centre for treatment, rehabilitation and continued supervision with drug testing. For offenders below 16 years of age, mandatory supervision with drug testing for 12 months is imposed instead.²⁰

In contrast, importers, sellers and distributors of etomidate-laced e-vaporisers face substantially harsher penalties, including imprisonment of up to 20 years and a maximum of 15 strokes of the cane, reflecting the gravity of offences involving drug trafficking and distribution.²⁰

Seeking help

People who use etomidate-laced vapes should seek professional help promptly. Early intervention is essential for better recovery outcomes. In Singapore, vape users can make an appointment with the National Addictions Management Service.²¹ Those who voluntarily seek help will not face any penalties, nor will they have an offence record.

During rehabilitation, the focus will be on addressing addictive behaviour through education, counselling and support to help individuals overcome their addiction. Nicotine replacement therapy will only be considered if individuals show signs of nicotine addiction and withdrawal symptoms.

Conclusion

Etomidate misuse through vaping devices represents an emerging public health concern. Although reports remain limited, available evidence clearly indicates that etomidate-laced vapes are harmful.

Vape devices are excellent conduits for drug delivery and this itself poses significant risks. We need to be more vigilant and look beyond etomidate, as abusers and illicit marketers continue to be creative. The customisability of the vape device makes it a versatile Pandora's box, and authorities and healthcare professionals must always be alert and anticipate the potential of more dangerous adulteration in the future. ♦

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