Novel treatment (new drug/intervention; established drug/procedure in new situation)

A novel possible strategy for the management of petrol sniffing addiction in adolescents

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Summary

Since the 1950s there have been many reports on petrol addiction, mostly describing the practice of petrol sniffing and its acute and chronic physical and psychological effects. To the authors' knowledge, none have described the use of opiates to manage and control this addiction.

We report the case of an 18-year-old boy who self-managed his petrol addiction. He had been inhalant sniffing since the age of 5 and petrol sniffing since the age of 15, and had undergone different treatments in unsuccessful efforts to break his addiction. However, he has now stopped sniffing petrol after taking tramadol 100 mg/day and methadone 10 mg/day.

This case report suggests that tramadol and methadone can be used for the management of petrol addiction.

BACKGROUND

To the authors' knowledge, no previous report has described a treatment strategy to manage and control petrol addiction.

CASE PRESENTATION

An 18-year-old boy presented to our out-patient psychiatry clinic with a history petrol sniffing and visual and auditory hallucinations. He had been sniffing inhalants frequently during the day and sometimes during the night continually since the age of 5. According to the patient and his mother, he liked to smell petrol products such as nail varnish and lacquer and had been sniffing petrol for the previous 3 years. He had been smoking since the age of 13 and also abused alcohol. He is a product of twin pregnancy and gestational, perinatal, developmental and medical histories were unremarkable. However, he did have attention deficit hyperactivity disorder. His physical examination was unremarkable. In the previous year, he had been hospitalised three times in efforts to cure his petrol addiction. He also had major depression and usually experienced visual and auditory hallucinations after prolonged petrol sniffing. He had taken different medications such as antidepressants, antipsychotics, clonidine and benzodiazepines and was also undergoing psychotherapy. However, none of the treatment strategies had resulted in discontinuation of the petrol addiction for more than 4 days. Each time he was hospitalised, he had discharged himself and abandoned his treatment plan. He was referred to the clinic about 6 months after his last hospitalisation. He had symptoms of bipolar mood disorder, manic phase without psychotic features.

Laboratory evaluation was unremarkable. It was interesting that for the previous 6 months the patient had ceased sniffing petrol after self-medicating with tramadol 100 mg/day and methadone 10 mg/day.

DISCUSSION

Since the 1950s there have been many reports on petrol addiction.^{1 2} These reports usually only describe the practice of inhaling petrol fumes, and its acute and chronic physical and psychological effects including visual hallucinations, changes in consciousness, euphoria, nystagmus, dizziness, weakness and tremors. Some of the studies described aetiological factors.³

In a study conducted in South Australia, 39 inhalant deaths were identified over approximately 20 years. Sixty-four per cent of them resulted from voluntary inhalation of volatile substances and young males were most at risk for accidental or suicidal inhalant death. The authors concluded that petrol inhalation is a significant problem in Aboriginal communities in South Australia.⁴ The replacement of leaded petrol by unleaded petrol to reduce lead toxicity in petrol sniffers in Aboriginal communities in Australia led to a significant reduction in hospitalisation due to petrol sniffing.⁵ There is little information about effective interventions for petrol sniffing.⁶

Tramadol is a synthetic opioid analgesic acting centrally whose mode of action is not completely understood. Two complementary mechanisms of action are binding of the parent and its metabolite to μ -opioid receptors and weak inhibition of reuptake of norepinephrine and serotonin.⁷ Tramadol-induced analgesia is only partially antagonised by the opiate antagonist naloxone. Tramadol hydrochloride has a mean absolute bioavailability of approximately 75% following administration of a single 100 mg oral dose. Some of the drug is excreted unchanged through the kidneys, while the remainder is metabolised by N- and O-demethylation, followed by conjugation with glucuronic acid and sulphate.⁸ The plasma elimination half-lives of racemic tramadol and M1 are approximately 5–6 and 7 h and increase to 7–9 h following multiple dosing.⁹

Methadone, a synthetic opioid agonist with morphine-like properties, is mostly used as a maintenance drug for opioid dependency through binding to μ , γ and κ opioid receptors. Methadone is one of the drugs of choice for maintenance therapy for opioid users.¹⁰

This case report is interesting because the patient switched his addiction from petrol to methadone and tramadol without experiencing withdrawal symptoms, and suggests that tramadol and methadone could possibly be used for the management of petrol addiction. Further studies might show if opioid agonists are useful in the maintenance management of petrol addiction.

Learning points

- ▶ There are no approved pharmacological strategies for treatment of gasoline addiction.
- ▶ Gasoline may induce different psychiatric problems such as visual hallucination and euphoria.
- ▶ Methadone as synthetic opioid agonist may be used for maintenance therapy of gasoline addiction.
- ▶ Tramadol may be useful for gasoline addiction withdrawal.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Faucett RL**, Jensen RA. Psychologic aspects of pediatrics: addiction to the inhalation of gasoline fumes in a child. *J Pediatr* 1952;**41**:364–8.
2. **Nitsche CJ**, Robinson JF. A case of gasoline addiction. *Am J Orthopsychiatry* 1959;**29**:417–19.
3. **Remington G**, Hoffman BF. Gas sniffing as a form of substance abuse. *Can J Psychiatry* 1984;**29**:31–5.
4. **Wick R**, Gilbert JD, Felgate P, *et al*. Inhalant deaths in South Australia: a 20-year retrospective autopsy study. *Am J Forensic Med Pathol* 2007;**28**:319–22.
5. **Burns CB**, Currie BJ, Powers JR. An evaluation of unleaded petrol as a harm reduction strategy for petrol sniffers in an aboriginal community. *J Toxicol Clin Toxicol* 1996;**34**:27–36.
6. **MacLean SJ**, d'Abbs PH. Petrol sniffing in Aboriginal communities: a review of interventions. *Drug Alcohol Rev* 2002;**21**:65–72.
7. **Raffa RB**, Friderichs E, Reimann W, *et al*. Opioid and nonopioid components independently contribute to the mechanism of action of tramadol, an 'atypical' opioid analgesic. *J Pharmacol Exp Ther* 1992;**260**:275–85.
8. **Gutstein HB**, Akil H. Opioid analgesics. In: Hardman JG, Linobird LE, eds. *Goodman & Gilman's The Pharmacological Basis of Therapeutics*. New York: McGraw-Hill 2001:569–620.
9. **Goeringer KE**, Logan BK, Christian GD. Identification of tramadol and its metabolites in blood from drug-related deaths and drug-impaired drivers. *J Anal Toxicol*. 1997;**21**:529–537.
10. **Blake AD**, Bot G, Freeman JC, *et al*. Differential opioid agonist regulation of the mouse mu opioid receptor. *J Biol Chem* 1997;**272**:782–90.

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