

Aerosol Addiction

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A case of dependency on prescribed pressurised aerosols in a patient with asthma and mild mental handicap is reported. The majority of reported cases involve young asthmatics, abuse being reported mainly using salbutamol inhalers although other inhalers have also given cause for concern. The agent of addiction is uncertain although it may be the fluorinated hydrocarbons used as propellants, rather than the active substance itself.

Drug abuse using the lungs as the source of entry is nothing new, having initially involved smoking of cannabis and opium. In recent times, however, abuse of solvents such as toluene and acetone has caused concern. Abuse of prescribed aerosols (sympathomimetic and steroid inhalers) is largely unknown although periodic case reports have been published (Table I). The majority of cases reported relate to mentally normal young people with asthma. The authors report a young asthmatic adult with mild mental handicap who abused his inhalers more frequently than in previously described cases.

Case report

A 27-year-old man of Sikh extraction with mild mental handicap and asthma was admitted to hospital with aggressive behaviour. Born in India following a normal pregnancy and delivery, his early developmental milestones were also normal. He came to England with his parents at the age of six. At school he was noticed to be slow in reading and writing (even allowing for cultural differences) and was diagnosed as having mild intellectual impairment of unknown origin by the school psychologist. He remained physically well and mentally stable until a visit to India at the age of 19 years during which he underwent an arranged marriage.

Two months later he had his first severe asthmatic attack. There was a family history, with his father also being asthmatic. He made a good recovery following treatment with a salbutamol inhaler. Over the subsequent years, further attacks were again treated with inhalers, containing either salbutamol and/or terbutaline sulphate. However, during this period, abuse of the inhalers occurred. Initially, he used two or three a week but this increased up to a maximum of six to eight a week. Consumption of the inhalers occurred as if they were 'confectionery'. The family noticed a temporal relationship between the inhaler abuse and aggression. While using the inhaler no aggression was seen. However, once it was finished he would demand another and if this was not available, both verbal and physical aggression occurred.

In 1984 (aged 22 years) admission to hospital occurred under Section 3 of the Mental Health Act 1973. He presented with continuous substance abuse and related aggression.

TABLE I
Review of reported cases of aerosol addiction/abuse

Author(s) & year	Age:	Substance abused
	years	
Edwards & Holgate (1974)	24	Salbutamol inhaler
Gluckman (1974)	51	Salbutamol tablets inhaler
Gaultier <i>et al</i> (1976)	22	Salbutamol inhaler
Kjelleman (1977)	14	Salbutamol respiratory solution (administered by PARI machine)
Pratt (1982)	15	Salbutamol inhaler
	15	Salbutamol inhaler
Thompson <i>et al</i> (1983)	17	Salbutamol & beclomethasone inhalers
Brennan (1983)	13	Salbutamol inhaler
	15	Salbutamol inhaler
	12	Salbutamol inhaler
	12	Salbutamol inhaler
	11	Salbutamol inhaler
Wikramoshinghe & Liebeschnetz (1983)	11	Salbutamol inhaler
Raine (1984)	17	Salbutamol inhaler
O'Callaghan & Milner (1988)	4	Salbutamol & beclomethasone inhalers

There was evidence of a psychosis, with bizarre behaviour involving depositing milk bottles in nearby streets, delusions of grandeur where he felt he could cure all his family ailments, repeated clicking of his fingers, and reduced insight. Management involved reduction in aerosol use, substituted with theophylline and addition of chlorpromazine (50 mg t.d.s.). All symptoms settled within a few days with no evidence of aggression or psychosis on discharge.

During the following year, further asthmatic attacks occurred and with reintroduction of the salbutamol inhaler abuse again followed. He was readmitted because of further verbal and physical aggression. Monitoring of inhaler use led to elimination of aggressive behaviour, with discharge 72 hours later.

The most recent admission occurred because of unacceptable aggression while demanding his terbutaline inhaler. The patient had punched and kicked his sister, thrown a cup across the room at his brother, permanently damaging his eye and pulled his father's beard while demanding his inhaler. He had also poured hot water over another sister and at one point, threatened his family with a kitchen knife. Violence was not confined to the home. On several occasions he caused a disturbance at both his general practitioner's surgery and local pharmacy leading to the recipient giving way and supplying further inhalers.

On this admission, no psychotic symptoms were demonstrated. His inhalation treatment was stopped completely and theophylline (200 mg b.d.) started which controlled his asthma. Once again, the patient settled quickly within a few days, being discharged home on oral bronchodilator medication, no abuse or aggression occurring to date. Other substance abuse (including alcohol, nicotine and caffeine) was absent throughout.

Discussion

Pressurised aerosol treatment for bronchospasm has revolutionised the management of asthma since its introduction 20 years ago. Generally, it is a safe and effective form of treatment.

Since Gluckman (1974) brought to attention the possible abuse of such treatments, few cases have been reported in 15 years (Table I). The majority are teenagers or young adults although exceptions of a child aged three and a half years and a man aged 51 years have been reported. All cases are of known asthmatics although as Brennan (1983) points out, in the young group, non-asthmatics can also become involved in such addiction. The present case report illustrates that people with mental handicap may be vulnerable to such behaviour.

The question whether this activity of deliberate repeated excessive consumption of aerosol substance is true dependence or not needs to be scrutinised closely. Dependence syndrome has recently been defined as including a strong desire or compulsion to use a substance, often referred to as 'craving'. There is evidence of impaired capacity to control initial use and levels or to terminate use. It may also include use of the substance to avoid withdrawal symptoms, evidence of tolerance, narrowing of patterns of substance abuse, progressive neglect of alternative pleasures, behaviours or interests, and persistence with substance use despite clear evidence of harmful consequence (World Health Organization, 1989).

Certainly the case report fulfils this definition as do many of the reviewed cases.

A further question of paramount importance which needs to be answered is, to which agent in the inhaler does addiction occur? The active antispasmodic in

all previously reported cases was salbutamol (beclomethasone additionally in two cases, Table I). However, now terbutaline has also been incriminated.

Salbutamol has been reported to have anti-depressant properties and terbutaline (another B2 adrenergic receptor stimulant) may act similarly (Widloche *et al*, 1977). However, studies using radiolabelled salbutamol in rats resulted in virtually none being distributed in the brain (Martin *et al*, 1971). Addiction to fluorocarbons used in domestic aerosols results in euphoria and intoxication (Bass, 1970). It has been shown that fluorocarbons are absorbed into the blood after inhalation (Dollery *et al*, 1970).

On balance, it is most possible that fluorinated hydrocarbons, rather than the active agent, are responsible for the stimulating and subsequent addiction effects. If this is the case, conversion to a dry powder system such as Rotacaps and Rotahalers or Diskhaler is recommended. This also allows for more accurate dose monitoring.

Pressurised aerosols are widely used with unquestionable benefit to the majority of asthmatic individuals. Abuse by a few must not, therefore, create disproportionate fear of addiction in vulnerable people in today's society of increased drug awareness. However, awareness of the possibility of aerosol addiction must exist among those in the caring professions.

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References

- BASS, M. (1970) Sudden sniffing death. *Journal American Medical Association*, **212**, 2075.
- BRENNAN, P. O. (1983) Addiction to aerosol treatment. *British Medical Journal*, **287**, 1877.
- DOLLERY, C. T., DRAFFAN, G. H., DAVIES, D. S., *et al* (1970) Blood concentrations in man of fluorinated hydrocarbons after inhalation of pressurised aerosols. *Lancet*, *ii*, 1164-1166.
- EDWARDS, J. G. & HOLGATE, S. T. (1974) Dependency upon salbutamol inhalers. *British Journal of Psychiatry*, **134**, 624-626.
- GAULTIER, M., GERVOIS, P., LAGIER, G., *et al* (1976) Pharmacodependence physique en salbutamol en aerosol chez une asthmatique. *Therapie*, **31**, 465.
- GLUCKMAN, L. (1974) Ventolin psychosis. *New Zealand Medical Journal*, **80**, 411.
- KJELLMAN, B. (1977) Case report: an asthmatic child with a very high consumption of ventolin respiratory solution. *Scandinavian Journal of Respiratory Diseases*, **101** (suppl.), 119-121.
- MARTIN, L. E., HOBSON, J. C., PAGE, J. A., *et al* (1971) Metabolic studies of salbutamol; a new bronchodilator in rat, rabbit, dog and monkey. *European Journal of Pharmacology*, **14**, 183-199.
- O'CALLAGHAN, C. & MILNER, A. D. (1988) Aerosol treatment abuse. *Archives of Disease in Childhood*, **63**, 70.

- PRATT, H. F. (1982) Abuse of salbutamol inhalers in young people. *Clinical Allergy*, 12, 203–209.
- RAINE, J. M. (1984) Addiction to aerosol treatment (letter). *British Medical Journal*, 288, 241.
- THOMPSON, P. J., DHILLON, P. & COLE, P. (1983) Addiction to aerosol treatments; the asthmatic alternative to glue sniffing. *British Medical Journal*, 287, 1515.
- WICKRAMOSINGHE, H. & LIEBESCHNETZ, H. J. (1983) Case report. *British Medical Journal*, 287, 1877.
- WIDLOCHE, D., LECRUBIER, Y., JONVENT, R., *et al* (1977) Antidepressant effect of salbutamol. *Lancet*, ii, 767.
- WORLD HEALTH ORGANISATION (1989) ICD-10. Chapter V draft. Diagnostic criteria for research. Geneva: WHO.

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Three Thousand Days of Pregnancy

A Case of Monosymptomatic Delusional Pseudocyesis Responding to Pimozide

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An unusual case of pseudocyesis of almost ten-year duration, characterised by a monosymptomatic hypochondriacal delusion and a selective response to pimozide is reported. The nosological status of the diagnosis, delusional (paranoid) disorder, is suggested to be a variety of the Kraepelinian concept of paranoia. The therapeutic pitfalls of relying on a phenomenological distinction between overvalued ideas and delusional beliefs are discussed.

Hypochondriacal or somatic delusions often occur in the course of major depression and schizophrenia (Munro, 1982). Where the clinical picture is dominated by a solitary hypochondriacal delusion, not secondary to another psychiatric disorder, the condition is known as monosymptomatic hypochondriacal psychosis (MHP). Despite a wide individual variety in delusional content, the clinical presentations are very similar and MHP is essentially synonymous with the Kraepelinian concept of paranoia: a chronic, encapsulated, monodelusional disorder in which the personality is relatively unaffected (Munro, 1982). Whereas Kraepelin himself abstained from delimitating a hypochondriacal form of paranoia, DSM-III-R (American Psychiatric Association, 1980) has recognised the concept of MHP under the rubric of delusional (paranoid) disorder, somatic type.

Pseudocyesis (literally 'false pregnancy') is an

uncommon condition, characterised by a conviction of pregnancy, often although not invariably associated with the somatic manifestations of the gravid state (Cohen, 1982; Trethowan, 1979). It is not restricted to women (Evans & Seely, 1984), can occur before or after the menarche or menopause (Barglow & Brown, 1972), and has been described under a variety of psychiatric nosological categories, including somatoform and mood disorders and schizophrenia (e.g. Mortimer & Banbery, 1988). The belief can range from a fleeting idea to a tenaciously held conviction (Cohen, 1982). Distinguishing between psychotic and non-psychotic varieties of pseudo-cyesis, simulated pregnancy, and pseudopregnancy caused by tumours, or endocrine changes mimicking symptoms of gravidity, may be difficult because elements of each diagnosis are often intermingled (Miller & Maricle, 1988).