Aspirin misuse: a case report*

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Misuse of non-prescribed medicine/over-the-counter products (NPM/OTC) is widespread. A UK cross-sectional survey sent to 1000 individuals revealed the lifetime prevalence of NPM/OTC misuse to be 19.3%, abuse to be 4.1%; and dependence to be 2%. Misuse of NPM/OTC agents can have devastating consequences. The Drug Abuse Warning Network, a US public watch system monitoring drug-related presentations to emergency departments and drug-related deaths, found that, in 2011, there were more than 1.2 million emergency room visits for non-medical use of prescription and NPM/OTC medications. Further, according to the US National Poison Data System, NPM/OTC products represent four of the top eight causes of single medicine suicidal poisonings (acetaminophen, aspirin, diphenhydramine, ibuprofen). Although NPM/OTC misuse remains a fraction of emergency department visits relative to prescription medications, its misuse is particularly prevalent in paediatric and adolescent populations as they often have easier access to these products than to illicit substances or prescribed medications. National Electronic Injury Surveillance System data from the US indicates NPM/OTC agents such as non-steroidal anti-inflammatory drugs, acetaminophen, cough syrup and antihistamines remain in the ten most frequent intentional substance ingestion among adolescents. As of 2003, as many as 4.7% of US high-school-age teens reported misusing NPM/OTC drugs. Misuse of these medicines is also seen in populations seeking alternatives to their drug of choice because of urine screening, other monitoring systems or restrictive settings.

There are significant consequences to NPM/OTC misuse. It can increase the risk of unintentional overdoses, medical complications, emergency room visits, admissions to hospital and overall healthcare costs. As a result, Reeves et al suggest clinicians expand their index of suspicion regarding the misuse potential of NPM/OTC medications, especially those that can have an impact on the central nervous system.

Aspirin misuse and dependence were first detailed in the Journal of the American Medical Association in 1940, and have been described in several case reports/series since then. In addition to continuous or episodic intake of aspirin without pharmacological purpose, cases describe deliberate salicylism (aspirin intoxication) to produce conditions of elation or inebriation. Although salicylism received attention through the 1970s, the disorder has been poorly reported in the following decades. The possible mechanisms of aspirin-induced euphoria have also not been elucidated. Better understanding of this disorder may be valuable in light of the continued high prevalence of NPM/OTC misuse. We report here a case of recurrent intentional salicylate intoxication in order to achieve a sensation of elation. We discuss the challenges of identifying and treating aspirin and NPM/OTC medication misuse.

Case

Our patient was a 49-year-old White man. He presented to the emergency department with ataxia and confusion following ingestion of an unknown amount of aspirin. On the day of admission, he was leaning towards his left when walking, and appeared confused while attending a community behavioural health programme. His past psychiatric history was significant for schizoaffective disorder, bipolar type; Tourette syndrome; multiple suicide attempts; and benzodiazepines. From staff at his community behavioural health programme, he was also known to take other patients' medications. He had no significant past medical history and lived in a group home. Upon arrival in the emergency room the patient was lethargic but arousable, and was oriented to date and time but not to place. He denied ingesting any other substances besides his prescribed medications that morning. All standard laboratories were within normal limits except for a CO2 of 19.2 mmol/L, indicating metabolic acidosis, an anion gap of 13 mEq/L and a blood salicylate level of 43 mg/dL. His lithium level was 0.84 mEq/L. Acetaminophen levels were <15.0 µg/mL. The urine toxicology screen was negative for all illicit substances tested. A computed tomography scan of his head without contrast revealed no acute intracranial haemorrhage or midline shift. An electrocardiogram showed normal sinus rhythm, and a QTc interval of 447 ms.

On questioning, the patient admitted to taking '3 Tylenol' (acetaminophen, paracetamol) that morning because it made him 'feel good', despite having no acetaminophen in his system. He denied

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By DSM-5 criteria, aspirin misuse in this patient appears to be consistent with an ‘other substance use disorder’. This diagnosis represents a pattern of using an intoxicating substance not categorised within the more common substance use disorders. The use leads to clinically significant impairment or distress within a 12-month period. Some elements of the diagnosis, applicable to our patient, include the following.

(a) The substance was taken in greater quantities and over a longer period than anticipated.
(b) There were strong longings to use the substance.
(c) There was continued substance use despite social difficulties.
(d) Substance use occurred in dangerous conditions.
(e) Consumption of the substance persisted despite awareness of its harmful physical and psychological impact.

Salicylsalicylic acid toxicity, or salicylate intoxication, can occur with blood concentrations of salicylate >35 mg/dL. Signs and symptoms of toxicity include nausea, dizziness, vomiting, confusion, tinnitus, psychosis and coma. Medullary respiratory activation can arise, leading to hyperventilation with respiratory alkalosis, followed by metabolic acidosis. Effects of chronic minor analgesic misuse and salicylate poisoning may result in organic damage, including nephropathy, peptic ulceration, infertility, as well as bleeding, anaemia or death; aspirin has also been used in deliberate self-poisoning.

Some of the usually undesirable effects of aspirin intoxication such as dizziness, hyperventilation and confusion may be pleasurable for some individuals, potentially leading to deliberate aspirin consumption. Although aspirin misuse with subjective elation received some attention in the 1960s and 1970s, the disorder has not been elucidated in the decades since then. Mentions of intentional salicylsalicylsalicylic acid misuse for pleasure since 1980 arise primarily in textbooks. One 1983 text discussed misuse of minor analgesics such as aspirin and phenacetin, noting that for some, these medications induced feelings of well-being and pleasure. The definition of misuse used was consumption of 1 g daily for 3 years or total consumption of 1 kg over 3 years. Others have also noted the phenomenon of pleasure-seeking salicylsalicylsalicylic acidism, although a possible mechanism has not been described.

Our patient demonstrated the need for NPM/OTC medication misuse screening. Current American Psychiatric Association Practice Guidelines suggest assessing for NPM/OTC medication misuse during patient interviews, however, clinical approaches and specific questions used to assess substance use may vary, as can practice guidelines from other medical specialties. Our patient had a prior admission to hospital for intentional salicylsalicylsalicylate intoxication and had described chronic NPM/OTC misuse for years. However, this disorder was only identified during the current admission to hospital with the benefit of toxicology. Routine and standardised screening for NPM/OTC medication misuse in both the out-patient and in-patient settings could have allowed for earlier identification and initiation of treatment. This may have reduced health complications from chronic analgesic misuse and reduced hospital admissions for aspirin overdose. Overall, early identification would help decrease NPM/OTC medication morbidity and mortality worldwide. Avoiding preventable admissions to hospital would reduce healthcare costs.

Our patient developed an aspirin-use disorder despite living in a monitored group home. This case highlights the risk of NPM/OTC medication misuse in controlled facilities, such as group homes, nursing homes, rehabilitation facilities, prisons and in other populations with restricted access to conventional substances and medications of misuse. In fact, it has been demonstrated that incarcerated patients still maintain access to aspirin and other NPM/OTC medications. Prisoners may purchase medications from the dispensary or their cell-mates. They can even obtain them via diversion from medical staff. Therefore, clinicians should be vigilant for NPM/OTC medication misuse in patients living in controlled settings who are otherwise restricted from conventional substances of misuse.

Beyond proper identification of NPM/OTC medication misuse, better guidelines for intervention and treatment of NPM/OTC medication dependence and misuse are required. One limited
internet study noted that despite 66% of UK primary care and pharmacy staffs suspecting addiction to medicines, including NPM/OTC agents, in their patients, just 17% started conversations about it. As many NPM/OTC agents carry significant and potentially life-threatening side-effects when consumed in excess, it is important that clinicians be equipped to both identify and intervene when confronted with the challenge of NPM/OTC medication misuse. Finally, as with dextromethorphan and pseudoephedrine, there may be a need for government legislation to help monitor and reduce access to NPM/OTCs that are misused and/or used for self-harm.

Implications
Aspirin misuse is a medication-use disorder underreported in the medical literature. With the continued high prevalence of NPM/OTC misuse, it remains important for clinicians to be able to identify signs and symptoms of aspirin-use disorders using directed questions and toxicology screening, which remains a vital diagnostic element. Clinicians should be prepared to recommend effective treatment modalities and educate patients about the risks and consequences associated with non-medical aspirin use.

References
3 Kang AM. Substances involved in suicidal poisonings in the United States. Suicide Life Threat Behav 2018; Aug 15 (Epub ahead of print).
7 Queries and minor notes. JAMA 1940; 115: 798–9.

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