est aussi aggravée par le tabagisme et la prise de cocaine, n’a pas pu être réalisée chez cette patiente avant traitement [4]. En tout état de cause, il est possible qu’ici le mécanisme responsable soit mixte comme certainement dans beaucoup de situations demeurées inexpliquées. Le tabagisme occupe une part prédominante dans la physiopathologie de ces événements pour son rôle sur les plaquettes et au niveau de l’endothélium vasculaire ; et il est régulièrement présent dans les SCA du sujet jeune [3,4]. Enfin la sarcoïdose pourrait se compliquer d’anomalies notamment de spasmes de la microcirculation coronaire et ainsi avoir contribué à la survenue d’un SCA [13].

Le pronostic de ces patients apparaît relativement favorable par rapport aux porteurs de lésions d’athérome. Effectivement plusieurs publications font état de l’absence de récidive dans 85 à 96 % des cas [1,3,5,14]. Cependant, il s’agit de séries de faibles effectifs peut-être très hétérogènes en ce qui concerne la cause du SCA dont le risque au long cours dépend certainement de la persistance ou non du ou des facteurs déclenchant. À ce titre, la prise en charge thérapeutique si elle est bien codifiée en phase aiguë pose d’autres problèmes pour la suite. Il est évident que le sevrage tabagique est impératif. La survenue d’un SCA est une indication pour poursuivre une double anti-agrégrant plaquettaire pendant un an. Mais au-delà, qu’en est-il vis-à-vis de troubles de la coagulation pour lesquels l’intérêt d’un traitement au long cours est méconnu ?

**Conclusion**

Cette observation illustre une problématique peu fréquente en posant la question du mécanisme physiopathologique d’un infarctus sans lésion athéromateuse sous-jacente visible. L’imagerie moderne permet de mieux l’appréhender. La prise en charge thérapeutique en découle et vise à couvrir les différents facteurs favorisants quand ils sont individualisés, ce qui n’est malheureusement encore pas toujours le cas.

**Déclaration d’intérêts** : les auteurs déclarent ne pas avoir de conflits d’intérêts en relation avec cet article.

**Références**


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component, is proposed as a new psychiatric disorder for consideration in the sexual disorders section for DSM-V [2]. It presents a number of clinical elements in favour of an addictive disorder. The main clinical symptoms are the frequent preoccupation with this type of behaviour, the time spent in sexual activities, the continuation of this behaviour despite its negative consequences, the repeated and unsuccessful efforts made to reduce the behaviour and the withdrawal symptoms after abrupt discontinuation of the behaviour [3]. Hypersexual behaviours have been described in the literature such as compulsive cruising and multiple partners, compulsive fixation on an unattainable partner, compulsive masturbation, compulsive use of online sexual imagery, compulsive use of the internet for sexual purposes, compulsive multiple love relationships, and compulsive sexuality in a relationship [4]. All these behaviours can result in numerous health and social problems such as sexually transmitted diseases, exposure to human immunodeficiency virus or hepatitis virus, problems in maintaining a relationship or a marriage, domestic violence, unwanted pregnancies, and legal consequences. In addition, there is a strong link between excessive sexual behaviour and comorbid Axis I (mood disorders, anxiety disorders, especially social phobia, childhood attention-deficit/hyperactivity disorder) and Axis II (histrionic, paranoid, obsessive compulsive, and passive aggressive types) psychiatric disorders [4,5]. Other addictive behaviours (compulsive buying, pathological gambling, compulsive exercise) and/or substance abuse or dependence are also found in this population. Nitrite inhalants, also known as poppers, are alkyl nitrites (e.g., amyl, butyl, isopropyl), which are highly volatile colourless or yellow liquids at room temperature. Poppers are rapid-onset, short-acting potent vasodilators that produce a rush characterized by warm sensations and feelings of dizziness. These peripheral vasodilators are frequently used by men who have sex with men (MSM). Poppers, also used by other-sexual relations (OSR) youth and adults, facilitate sexual intercourse and/or produce euphoria [6]. Poppers are often abused during sexual activity but, to our knowledge, no dependence syndrome associated with hypersexuality, has ever been described.

We present hereafter the case of a patient who developed poppers dependence with online hypersexuality.

A single 45-year-old man having sex with men, was referred to our outpatient department for hypersexuality treatment by his general practitioner. He was employed in a college as a teacher but had not actually been working for six months because of a major depressive disorder. His medical and psychiatric history included past nicotine dependence, and a past major depressive disorder actually treated by venlafaxine 112.5 mg/day for five years. Our patient reported his first poppers use at 24-year-old during a MSM intercourse. One year later, he increased the poppers dosage during MSM intercourses and especially when he watched OSR pornographic movies. Two years later, daily compulsive masturbation was exclusively associated with an important sexual use of the internet and poppers consumption. For 15 years, he had bought packs of poppers bottles (13 mL each) over the internet or at various venues including sex shops and sex bars. Our patient reported dependence symptoms such as tolerance, craving, time spent using poppers and daily use. He never reported withdrawal symptoms because he always had poppers available in his house. Sexual craving was triggered or exacerbated during times of increased stress and/or affective arousal. His hypersexual ritual, more than three times per day, followed this cycle: legal or illegal downloading of OSR movies, movies self-editing during a couple of hours, poppers use, movies watching and masturbation. His social life became quickly very poor. He reported anxiety, insomnia, anorexia and depressive symptoms such as sadness, anhedonia, and fatigue. His physical examination was normal, and urinary drug screening was negative.

The patient agreed to join our integrated outpatient treatment program that consisted in poppers detoxification (use of non-benzodiazepine anxiolytic), individual cognitive behavioural therapy and selective serotonin reuptake inhibitors (SSRIs) medication for hypersexuality and depressive disorder. We stopped his venlafaxine medication because of its weak effects on mood disorder and hypersexuality. We switched it to escitalpram 20 mg/day. Observance and retention were good and no side effects have been reported. Our patient is abstinent since four weeks and the treatment is effective on the main previous reported symptoms.

Two types of sexual behaviour are most likely to become excessive. These are masturbation, which probably is the most common, and the sexual use of the internet. Men are more likely to access sexually explicit material online and use the internet as an almost limitless extension of their compulsive masturbatory behaviour [7]. People, like our patient, with a hypersexual disorder may have an affective deregulation. Mood and anxiety disorders are frequent comorbidities. Furthermore, the SSRIs appear to be useful in decreasing symptoms of hypersexual and mood disorder [8]. Substance abuse is a frequent comorbidity found in patients suffering from hypersexual disorder [4].

We are not aware of published data of autoerotic activities linked with compulsive use of online sexual imagery and poppers use. The proportion of males who used nitrites is most of the time higher than the percentage of females reporting lifetime use [9]. The main positive effect of poppers creates a euphoria that can decrease inhibitions, increase sexual drive, and intensify the sensations of orgasm [6]. It could explain the synergistic effects of the combination of poppers and compulsive use of online sexual imagery.
Acute and chronic toxicity of inhaled nitrites in humans [9] are summarized in the Table I. Poppers have been associated with risky sexual behaviour, prevalent HIV infection, and with increased risk of HIV seroconversion [10]. Our patient did not report specific acute adverse effects but chronic ones such as depression and impaired learning and memory, which may be linked to the poppers-induced neurotoxicity.

In 1990, a French decree forbade the sale or the free distribution of products containing butyl or pentyl nitrites or their isomers. Then, other nitrites (e.g. propyl, isopropyl, cyclohexyl) became available on the market. The French National Committee of Narcotics and Psychotropics (FNCNP) made, in 1999, a review on the dangerousness of poppers (310 cases report of acute poisoning). These data had led the FNCNP to submit a request by several associations or trading companies. This measure was excessive and disproportionate towards the risks presented by the marketing of these products for the health and safety of the users. Until this day, butyl and pentyl nitrites are still forbidden while other nitrites are not anymore forbidden.

According to the Trend network (tendances récentes et nouvelles drogues/recent trends and new drugs) in Paris, Marseille, Lille, the French-Belgian border and in Toulouse in the homosexual festive scene [11], the availability of poppers is persistent but there is a more complex accessibility since the application of the 2007 decree, its related price increase, and the new available nitrites. However, a significant decrease of poppers use in the festive scene has not been reported due to possible personal imports from orders on the internet or from purchases abroad, but also from hidden sales in sex shops, sex clubs, dancing clubs and saunas.

Significant medical and psychiatric morbidity is associated with poppers acute or chronic use. Poppers are more often the object of a limited or chronic individual abuse [12] but the evaluation of the risk of dependence must be completed. Clinicians have to take into account poppers or designer drugs use (GBL, synthetic cathinones such as mephedrone, methylone… ) [13,14] when treating hypersexual disorder. These two disorders are frequently comorbid and one could exacerbate the toxicity of the other.

Disclosure of interest: the authors declare they have no conflicts of interest concerning this article.

References


Table I

<table>
<thead>
<tr>
<th>Acute toxicity</th>
<th>Chronic toxicity</th>
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<tbody>
<tr>
<td>Skin irritations around the nose and lips</td>
<td>Pneumonia, emphysema</td>
</tr>
<tr>
<td>Burns from inadvertent ignition of the vapor</td>
<td>Anemia</td>
</tr>
<tr>
<td>Dermatitis</td>
<td>Leukemia</td>
</tr>
<tr>
<td>Hypotension, cardiac arrhythmias, ventricular fibrillation (sudden sniffing death syndrome)</td>
<td>Bone marrow suppression</td>
</tr>
<tr>
<td>Tracheobronchial irritation, respiratory depression</td>
<td>Liver toxicity</td>
</tr>
<tr>
<td>Headache</td>
<td>Metabolic acidosis or alkalosis</td>
</tr>
<tr>
<td>Nausea, vomiting</td>
<td>Acute renal failure</td>
</tr>
<tr>
<td>Methemoglobinemia</td>
<td>Fanconi’s syndrome</td>
</tr>
<tr>
<td>Retinal toxicity</td>
<td>Increased risk for HIV</td>
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<tr>
<td>Coma</td>
<td>Increased risk for major depression</td>
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<td></td>
<td>Increased risk for suicide</td>
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<tr>
<td></td>
<td>Binge drinking</td>
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<tr>
<td></td>
<td>Cognitive deficits</td>
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<tr>
<td></td>
<td>(impaired learning and memory)</td>
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<tr>
<td></td>
<td>More substance use disorders</td>
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