



Chemsex: review of the current literature and treatment guidelines

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Abstract

Purpose of the review Chemsex mainly concerned men who have sex with men, but seems to spread in general population. Clinical characteristics and expected effects are diverse. This paper aims at reviewing existing literature on chemsex and providing treatment guidelines.

Recent findings The use of substances for improving or extending sexual intercourses is commonly referred to as chemsex. Substances used are mainly methamphetamine, GHB/GBL, cocaine and cathinones. Prevalence is estimated between 3 and 42% of MSM. Risk factors are mainly living in a metropolis, using dating apps and practicing "hard-sex". Chemsex practice is not necessarily pathological and only the loss of control, the association with addictive, psychiatric and/or infectious comorbidities should require care.

Summary Management of problematic chemsex should be multidisciplinary and must take into account psychiatric, addictive and infectious comorbidities. Information and education are crucial in order to reduce risks and potential harm associated to chemsex.

Keywords Chemical sex · Chemsex · Sexualized drugs · Treatment · MSM

Introduction

Chemsex is not necessarily an addictive, sexual or psychiatric disorder. Most people using chemsex do not see themselves as patients, or as having a disease or as needing care.

However chemsex practice is frequent and insufficiently recognized. This sexual behavior can be associated with multiple comorbidities and/or side effects. In addition, it can result in personal suffering, social, professional and family difficulties and a deterioration of the quality of life. Its prevalence is difficult to assess and the characteristics of chemsex users as well as the desired effects and motivations for use are diverse [1].

Our purpose was to conduct a literature review in order to provide information on the definition of chemsex, its prevalence, its clinical characteristics and to propose treatment options in case of problematic chemsex.

We have systematically reviewed the literature published between 1995 and 2022 using MEDLINE/Pubmed with the following keywords: "chemsex", "chemical sex", "party and play", "sexualized drugs", "sexual addiction" and "treatment" or "pharmacological treatment". All available articles in English or French were included.

Definition

The term "chemsex" comes from a contraction of two words "chemical" and "sex". It refers to the voluntary use of psychoactive substances during planned sex in order to initiate, facilitate, increase, intensify or prolong intercourse, orgasm and sexual performance as well as facilitate "hard" practices (e.g. "bareback" or unprotected anal penetration, fisting/fist-fucking, BDSM (Bondage Domination Sadism and Masochism), etc.). They can also be used to increase self-confidence and decrease a feeling of loneliness. The term "chemsex" is preferentially used, but the terms "Party

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and Play” or “sexualized drugs” are also employed. The term “chemsex” originated in the gay community in the 90’s [2]. Men who had Sex with Men (MSM) were the first to report this sexual practice worldwide (USA, Europe, Australia, etc.) [3, 4].

Most often, the practice of chemsex is associated with group sex, favored by social networks in MSM communities [4]. This was exacerbated by the increasing use of dating apps and online dating [2].

The most commonly used psychoactive substances are crystal methamphetamine (also called “tina”, “ice” or “crystal meth”), gamma-hydroxybutyrate/gamma-butyrolactone (GHB or GBL its prodrug) (also called “blue nitrate” or “G” preparation), alkyl nitrites (poppers), cocaine or ketamine ((2-(2-chlorophenyl)-2-(methylamino)-cyclohexan-1-one) and synthetic cathinones. Cathinone is a naturally occurring beta-ketone amphetamine analogue (also called bkamphetamine). Synthetic cathinones (such as mephedrone or 4-methylmethcathinone [4MMC]) are derivatives of this compound. The different cathinones used vary very quickly to circumvent legal prohibitions. The most represented are: 3-MMC (3-Methyl-Meth-Cathinone), 4-MEC (4-Methyl-Eth-Cathinone), 3-Chloromethcathinone (3-CMC), 4-Chloromethcathinone (4-CMC), alpha-PVP (alpha-pyrrolidinopentiophenone) and alpha-PHP (alpha-pyrrolidinohexiophenone). Psychoactive substances can be swallowed, snorted, smoked, used via anal plug or injected (colloquially referred to as “slamming” or “slam sex”). According to the strict definition of chemsex, alcohol, cannabis or even psychotropic treatments such as benzodiazepines do not fall within the substances concerned, but correspond to addictive comorbidities.

In most cases, a combination of different illicit substances is preferred, often associated with treatments to facilitate erection, as well as HIV antiretroviral prophylaxis (PreP). For example, in the United Kingdom, 74.1% of 397 MSM using chemsex, reported using two or more illicit drugs [5].

During the “descent phase” which can last up to 5 days, alcohol and benzodiazepines are often used to decrease anxiety.

Prevalence

Prevalence was mainly estimated in MSM populations. Worldwide, there is a great heterogeneity of prevalence in the literature ranging from 3 to 45% of MSM in the previous 6 to 12 months (6–8). This heterogeneity could be explained by the methods of recruitment of the populations and also by the definitions of chemsex that varied significantly between studies. Thus, some studies included cocaine or ketamine as substances consumed, while other studies only considered

the use of synthetic cathinones, GHB/GBL and/or crystal methamphetamine.

Three studies found similar results between 16.5 and 17.6% of MSM (9–11) while two others were close to 6% among MSM [12, 13]. The prevalence of slam was estimated between 1 and 50% in MSM populations [14]; among slam users, 5 to 56% shared injection equipment [7, 8].

As previously mentioned, the term chemsex was mainly used in MSM populations. However, a recent study carried out in the general population, found that in a cohort of 680 French students, psychoactive substances were used in a sexual context in 22.5% of students [15]. The substances most frequently used were alcohol (80.4%), cannabis (47.1%), 3,4-methylenedioxy-methamphetamine (MDMA or ecstasy, “love drug” with entactogenic effect) (23.5%) and cocaine (11.8%). The main risk factors associated with chemsex in this population were dating application use, frequent pornography use, having a sexual partner using psychoactive substances, celibacy, homo or bi-sexual orientation. These practices differ from those described in MSM populations since they do not involve the same substances, they are associated with different sexual behaviors and are underpinned by different social representations and issues.

Clinical characteristics and expected effects in chemsex users

According to the strict definition of chemsex, this practice only concerns Men who have Sex with Men (MSM). The use of psychoactive substances in a sexual context may concern the general population, but the term “chemsex” is, in the literature, specific to this population. The practice of chemsex is more often reported between the age of 30 and 45 [10, 13, 16] with a peak between 32 and 42 years old [14]. According to the French Observatory on Drugs and Drug Addiction (OFDT), chemsex is more likely to affect MSM under 40 (OR 31% compared to older people) [17].

The practice of slam was significantly associated with a longer duration of chemsex use and an older age [18]. In contrast, Sewell et al. did not find any association between chemsex and age [6].

People practicing chemsex have a higher level of education on average [3, 9, 19] compared to the general MSM population except for those practicing slam who would have a lower socio-economic level [18]. Hibbert [12] found an association with living in an urban, densely populated area and chemsex use. Large European cities, (e.g. London, Brighton, Manchester, Paris Barcelona, Madrid, Valencia) are particularly affected [20].

The prevalence of chemsex seems to be associated with a greater number of sexual partners, and/or so-called “hard” practices [21].

A deterioration in the quality of sexual life is often associated with chemsex. Sexual relationships become impossible without substance use, or are described as tasteless. For some patients, sexuality is reduced to drug use with or without pornography.

In many studies, HIV infection was linked to chemsex [8]. Among 544 participants, McCormack found that almost 50% of PrEP users have used GHB/GBL, methamphetamine or mephedrone in the past 3 months [22]. HIV positive people who practice chemsex tend to be older [5, 12]. Two-thirds of HIV-positive patients reported anal sex with casual partners; of these men, three-quarters disclosed one or more condomless acts in the previous 12 months. HIV-infected MSM who use methamphetamine were more likely to have sex with people who slam, with many partners and have group sex, meet sexual partners online, use illicit substances during sex, and participate in unprotected anal intercourse than MSM who do not use methamphetamine, regardless of their HIV status [23].

In a French cohort of 71 patients using chemsex, attachment style was identified as a possible risk factor for chemsex. Only 9 (13%) had a secure attachment style. Among the remaining 87% with insecure attachment style, 38% were classified as preoccupied, 24% dismissing and 23% fearful. Attachment theory, as previously reported with other substance use disorders, could be a risk factor but is also a key factor in the treatment management [24].

The effects sought by chemsex users are mainly to increase sexual desire, arousal and pleasure [3, 12, 16, 19, 25, 26] (61% of respondents in Glynn et al. study [16]). The increase of the duration of the sexual intercourse is also desired [3, 12, 18, 19, 25, 26]. A disinhibitory effect obtained with certain illicit substances [3, 9, 18, 19, 26, 27] allows more unusual sex practices and so-called "hard" sex that would not be performed without substances [3, 12, 16, 19, 26, 27] (52% of cases in Glynn et al. study [16]).

Other effects less frequently sought are to fight a feeling of loneliness, to increase self-confidence and attractiveness, to rise emotional intimacy [26] or even to improve control over his sex life [16]. Sometimes, psychoactive substances help increasing sexual arousal within the couple. People involved in chemsex practices report being in a couple less often than those who do not practice (23% vs. 31% $p < 0.006$). When shared within the couple, this practice is often described to strengthen romantic and sexual intimacy, but also can also have a place outside the couple, in an "open" sex life [28].

Comorbidities

-Addictive comorbidities with other substance use disorders are commonly observed in clinical practice. However, few studies have looked at the prevalence of addictive disorders

in chemsex users. An association between chemsex, alcohol use disorder and tobacco use has been reported [7, 29]. It should be emphasized that for some patients, the use of psychoactive substances is gradually dissociated from sexual activity, substances are often consumed without a partner or even without sexual activity. In those who practice slam, injection per se is also a source of craving. The presence of comorbid sexual addiction is not mandatory [1]. The link between sexual addiction or hypersexuality and chemsex was poorly investigated although comorbidity between multiple use of substances and sexual addiction is known [1, 30]. In a recently study using the Sexual Compulsivity Scale, 23% of 341 MSM reported sexual addiction [31].

-Psychiatric disorders: few studies have properly assessed comorbidities between mental disorders and chemsex [32]. During substance use, the main side effects are pharmacopsychosis (acute delusional episode induced by substances) and "come down phase" (depressive symptoms lasting for 36 to 48 h, which may be associated with suicidal ideation). Patients frequently have depressive and anxious [17] or post-traumatic stress [33] comorbid symptoms. In 3,017 Australian MSM, the prevalence of depression and anxiety was 28.3% and 17.9% respectively [34]. Bui et al. [18] only found an association between the practice of "slam sex" and depression and/or anxiety (55.8% and 42.5% respectively). Chemsex users using substances outside of a sexual context seem to have more serious psychiatric comorbidities, in particular twice as many suicidal thoughts in the past year [28]. Being possibly linked to sexual addiction, a hyperactivity disorder must be systematically sought because of its frequent comorbidity.

Finally, consent to the sexual relationship is not systematically sought in the partner, exposing to sexual violence, which can induce post traumatic stress disorders.

-Infectious diseases: the practice of chemsex is associated with a three to ten times higher frequency of unprotected sex, and is suspected to play a role in the current upsurge in sexually-transmitted infections (STI) worldwide [32]. The practice of slam is associated with a higher risk of transmission of the hepatitis C virus (HCV) [35]. MSM who practice chemsex use more often antiretroviral HIV prophylaxis (PrEP) [29]. Sewell et al. reported that the prevalence of PrEP use and post-exposure prophylaxis use was 4.5 and 14% respectively, in patients using chemsex [36]. Antiretroviral therapy for people living with HIV (with the objective of non-transmissibility, guaranteed by an undetectable viral load) is therefore central to the treatment. The repetition of injections in the case of slam, which can reach ten injections during the same session, also exposes to side effects at the injection sites: foreign bodies, dermatological infections, etc.

- Sexual disorders: prolonged sexual sessions with the use of psychoactive substances can induce anal or genital lesions: anal trauma, abrasions of the penis... [37, 38].

Returning to drug-free sex is often described as impossible by many patients, which increases the risk of relapse. Erectile dysfunction with or even without substances is often reported [1]. Joint use of erection drugs, as self-medication, can be associated with serious side effects in particular with cathinone and methamphetamine use and even to death.

-Social functioning: some people become essentially focused on the practice of chemsex and the consequences on social functioning are severe with professional difficulties, isolation or impoverishment of social network [14, 39].

Clinical Assessment

The evaluation of problematic chemsex users must be global and multidisciplinary taking into account psychiatric, addictive, sexual and infectious aspects [1, 37, 40]. Treatment or referral to a psychiatrist or a specialist in addiction is, of course, not recommended to everyone practicing chemsex. The following clinical assessment allows a complete inventory of the sexual behavior and its potential consequences.

- Sexual preference
- Marital status
- Existence of family, friends, social support
- Past and current history of psychiatric disorder and history of substance use and abuse (anxiety and depressive symptoms, post-traumatic stress disorder, history of suicide, etc.)
- Past history of sexual abuse and other traumas,
- Existence of family or social breakdown in connection with the announcement of sexual orientation, history of discrimination
- Past or current history of sexually-transmitted infectious diseases (HIV, hepatitis, syphilis, others)
- Existence of a history of sexual addiction and/or paraphilia or paraphilic disorders
- Previous or current treatments (psychotropic drugs, antiretroviral, PrEP, post-exposure prophylaxis, erection drugs).
- Type of substances consumed and route of administration (swallowed, snorted, smoked, anal plug or "slam sex"), as well as polyuse.
- Duration of substance use
- Assessment of substance dependence or sexual addiction (assessment scales such as AUDIT for alcohol [41], PATHOS for sexual addiction [42], CCQ for cocaine [43] and others scales for illicit substances [44, 45] might be useful)
- Frequencies and duration of chemsex sessions
- Illicit substance use outside chemsex

- Existence of loss of consciousness during chemsex sessions (G-hole and/or K-hole with use of GHB/GBL and/or Ketamine respectively)
- Pharmacopsychosis or paranoia during or after substance use
- Psychological symptoms during the descent phase
- History of financial/ social; personal, even legal difficulties related to chemsex
- Cognitive distortions about sexuality
- Current and past history of sexual behaviour, type and frequency of various sexual behaviours
- Sexual practices, practice of "hard-sex"
- Risky sexual behaviours or fantasies
- Existence of erectile dysfunction and / or ejaculation
- Sexual functioning, sexual pain
- Any sexual behavior without substances
- Sexual violence or constraint and non-respect of consent during chemsex

PrEP prescriptions, diagnosis and follow-up of AIDS and other infectious diseases and more rarely psychiatric comorbidities including anxio-depressive disorders and/or suicidal ideation or even personal suffering or difficulties are the main reasons for consultation. General information and education on the potential risks associated to chemsex as well as on the necessary treatment of psychiatric, addictive or somatic comorbidities is important in chemsex user populations. Places of care, role of general practitioners or patients' associations must be emphasized, especially in MSM communities.

A rapid and urgent referral to a specialized practitioner is necessary during traumatic experiences and experiences of exceeding the limits of consent; psychiatric or addictive comorbidities, recurrent STI and consequences on social and/or professional life. Endangerment, loss of control over chemsex or even social suffering (social isolation, professional or financial difficulties...) are key markers for initiating specialized follow-up.

Treatments

Chemsex behavior becomes problematic when the behavior is out of control (sexual behavior or substance use) with a suffering of the individual and negative consequences on his health and quality of life. With regard to treatments proposed, a distinction must be made between transient symptoms associated to acute use of chemical substances and true psychiatric disorders. The presence of severe symptoms, both psychological and somatic, should alert practitioners. The management should be comprehensive and multidisciplinary and must first identify the objectives of care with the patient.

The DSM-5-TR criteria for Substance Use Disorder [46] can be used to define substance dependence and the ICD-11 criteria to define compulsive sexual behavior disorder [47]. In current clinical practice, the management of severe chemsex behavior is mainly focused on the treatment of psychiatric and addictive comorbidities as well as on somatic comorbidities.

Risk and harm reduction

In all cases, a risk reduction approach should be discussed with people engaged in chemsex, both on an ad hoc basis and when there seems to be a loss of control [48]. Information and education about the illicit substances taken and the risk associated to their modalities of use should be provided to all chemsex users.

Regarding practices, the planning of chemsex sessions should be promoted, with duration and frequency objectives. Vaccinations (Hepatitis A and B, Meningococcus C), screening for STIs (every three months) and prophylactic treatment by Prep must be promoted. Likewise, the use of condoms should be encouraged. Injection kits and sniffing straws and their recommendations for single use must be highlighted.

Clear and appropriate information must be provided concerning the substances taken, their effects and side effects, as well as the consumption patterns associated with the lowest risks [39].

Concerning the substances used, especially with GHB/GBL, the doses, time between doses, and the fact of not using the substance alone need to be addressed. Moreover, promoting sniffing instead of slamming and informing about the clinical signs of skin infection requiring a consultation is important.

The notion of consent in sexual practices according to the choice of illicit drugs used is a key factor to be questioned and possibly worked on during consultations.

Peer support workers, community associations and psycho-education applications can be important support in the reduction of risk.

Psychological treatments

To date and to our knowledge no psychotherapy has proven effective in the treatment of problematic chemsex.

Cognitive Behavioural Therapies (CBT) have been shown to be effective in substance use disorders [49]. Such psychotherapeutic techniques should be offered to people seeking help. This technique developed by Beck and Ellis is based on the postulate that cognitive maladjustments contribute to behavioural problems and emotional suffering and that targeted therapeutic approaches can change these maladaptive cognitions and thus change behaviors and the resulting suffering [50, 51]. CBT can be conducted individually or in groups. In the treatment of substance use disorders, however,

their efficacy is greater in cannabis and nicotine addictions compared to opiate addiction.

Third wave therapies such as Acceptance and Commitment Therapy (ACT), Dialectical Behavioral Therapy (DBT) or mindfulness-based relapse prevention may also be used. ACT emphasizes acceptance as a way to deal with negative thoughts, feelings, symptoms, or circumstances and DBT prioritizes living in the present moment, coping with stress and regulating emotions [52].

A sexological approach can be proposed to people engaged in chemsex, especially for those reporting sexual dysfunctions and/or those whose sexual behavior is systematically associated with substance use.

Self-help groups (community groups, chemsex support groups, Narcotics Anonymous, HIV support groups, sex support groups, etc.) can provide education and social support for people (knowledge of illicit substances, safer use, better control of consumption or withdrawal).

In the case of comorbid sexual addiction, previous World Federation of Societies of Biological Psychiatry (WFSBP) guidelines may apply [1].

Pharmacological treatments

Up to now, there was little research on the care of chemsex. In case of dependence to the main substances used (methamphetamine, GHB/GBL and/or cathinones), controlled studies are scarce. No treatment has demonstrated a large and potent positive effect on abstinence in phase II trials [53, 54]. The opioid pathway has been disappointing with a negative randomized controlled trial of naltrexone [55]. The oxytocin pathway is currently under investigation [56]. Presently, there are no guidelines for effective management of methamphetamine, ketamine, synthetic cathinones or GHB/GBL use disorders, and no pharmacological treatments are approved.

Until recently, regarding methamphetamine, efficacy studies of pharmacological treatments such as selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, bupropion, varenicline and methylphenidate have been largely negative [57–61] [56–60]. On the other hand, in a recent study, Siefried et al. [62] came to the conclusion that while no pharmaceutical treatment had produced conclusive outcomes, some compounds such as methylphenidate, dexamphetamine [63], naltrexone, mirtazapine, or topiramate might however be interesting. Among them, in 150 MSM who engaged in chemsex with methamphetamine, mirtazapine (30 mg/day) decreased methamphetamine use and risky sexual behaviour at week 24 and the effect persisted 12 weeks later [64].

Only one case report described a man with cathinone dependence and depression who was improved by bupropion [65].

Regarding GHB/GBL, in case of severe dependence, hospitalization is recommended for withdrawal management. A few case studies have suggested a possible reduction of craving by using baclofen [66, 67]. In 37 GHB-dependent patients, baclofen (45–60 mg/day) was associated with reduced relapse and drop-out rates, compared to treatment as usual (mainly CBT, anxiolytics and treatment of withdrawal symptoms and comorbidities) in 70 GHB-dependent patients [67].

In case of comorbid sexual addiction, WFSBP guidelines on the assessment and pharmacological treatment of compulsive sexual behavior disorder may apply [1].

Only one controlled study (a 12-week double-blind study), including 28 homosexual or bisexual subjects with sexual addiction, compared the efficacy of 20–60 mg citalopram versus placebo. A significant reduction in sexual desire, masturbation frequency and use of pornography was reported, but the number of partners remained unchanged [68]. Other uncontrolled studies have shown the possible effectiveness of other SSRIs in sexual addiction especially in patients with comorbid depressive, anxiety or obsessive–compulsive disorders [69]. In case of inefficacy of an SSRI, or in patients with comorbid addictive disorders, naltrexone could (in monotherapy or associated with an SSRI) improve sexual addiction [69].

Repeated stimulation with direct current transcranial stimulation (tDCS) of the dorso-lateral prefrontal cortex (DLPFC) reduced craving in a MSM patient, which was associated with an improvement of cathinone use (3-MMC) and dependence to chemsex [70]. Indeed, in parallel with treatment with 40 mg per day of paroxetine, after 5 daily sessions of stimulation by tDCS, chemsex behavior was stopped with significant patient relief. This positive result was still present at 1 year of follow-up. Further studies are necessary to confirm this promising result.

Multidisciplinary management in close collaboration with sexual health and infectious disease services, especially for the management of preventive or curative treatment of HIV infection is essential [40]. Moreover, erectile dysfunction is often reported in people engaging in chemsex [1]. Phosphodiesterase-5 inhibitors (on demand or daily) or prostaglandin E1 (administered intracavernously or using vacuum pump) as second-line treatments, have shown efficacy to improve erectile disorders (Füllhase and Yafi's studies on their tolerance [71, 72]). However, patients must be informed on the risk of potential severe side effects of these medications, particularly cardiac effects (hypertension, acute and chronic myocardial toxicity, stroke, coronary artery disease, and sudden cardiac death), especially with methamphetamine and cathinones used in association with erectile drugs [35, 73, 74].

Finally, cytochromes P450 (CYP450) and P2D6 (CYP2D6) are involved in the metabolism of new illicit

drugs but also antiretrovirals and anti-HCVs. In addition, some antiviral molecules (such as ritonavir, cobicistat, simeprevir, paritaprevir, grazoprevir) have an inhibitory effect on these cytochromes and could potentiate the activity of the illicit substances consumed and lead to an overdose [75, 76]. It is therefore important to know the antiviral treatments taken by people involved in chemsex and to discuss with other specialists the best therapeutic options to limit the risks.

Conclusion

Chemsex is therefore frequently observed in MSM communities and tends to spread in the general population. Significant psychiatric, addictive, infectious and sexual comorbidities could be observed. Chemsex users are also more often exposed to serious social, family, professional and even legal consequences.

Further studies are needed to improve knowledge about chemsex practice and risks associated to it. A global and multidisciplinary approach in the care of problematic chemsex users experiencing psychiatric, addictive comorbidities or sexually-transmitted infections is necessary.

Psychoeducation is crucial in order to decrease the risk of infectious diseases and the risk of undiagnosed psychiatric and somatic side effects associated to chemsex and especially illicit drugs use and the risk associated with their use.

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