
# An international study of the prevalence of substance use in patients with delusional infestation

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# Prevalence of Substance Use in Delusional Infestation


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## Introduction

Delusional infestation is a relatively rare disorder characterised by the belief of being infested with living or non-living organisms [1]. Classically, patients present with the belief that they have these organisms on or underneath their skin but many other presentations are possible including beliefs of an infestation of the patient's immediate environment or organs other than the skin. The illness is usually classed as a mono-delusional disorder and shared delusional beliefs as well as delusions by proxy are possible [2]. The imaginary pathogens have changed over time but insects and worms are still the most common. Non-living pathogens have increasingly been named by patients as the cause for their symptoms such as fibers or threads coming out of their skin [1]. The most recent study suggests that a quarter of patients are now presenting with non-living pathogens [3]. Delusional infestation can be primary as well as secondary. As a primary delusional disorder it meets criteria of a persistent delusional disorder in ICD 10 (code F22) or a delusional disorder somatic type in DSM- IV-TR (code 297.1) As a secondary phenomenon it is associated with a number of illnesses: mental illnesses such as schizophrenia, dementia and depression, medical illnesses such as diabetes, certain cancers that can cause pruritus, stroke and substance misuse particularly with stimulants. Prescribed medication which can frequently cause pruritogenic or dermatological adverse events such as erythema, itch and rashes can also cause secondary delusion infestation [1].

Dermatologists are usually often the first specialist patients with DI get referred to [1], because dermatological symptoms are common in DI and often the main complaint. A survey amongst UK dermatologists showed that most had seen DI patients in the last 3 years and half had at least one current open case [6]. Referrals to psychiatry are usually rejected by patients on the basis that they do not think they have a mental illness [1]. Treatment suggestions have been made to allow dermatologists to

effectively treat DI patients in their clinics [7,8] rather than loosing the patient to any treatment by insisting on the patient's engagement with psychiatric services.

It has been well described in the literature that the use of cocaine and other stimulants can cause acute symptoms of delusional infestation. In the past this has been called "cocaine bugs", however, there is a long list of prescribed and non- prescribed medications and substances that have been implicated with delusional infestation including amphetamines, cannabis, codeine, certain antibiotics and non-steroidal anti-inflammatory drugs to name but a few.

Little is known about the prevalence of substance use in patients with delusional infestation. In a small pilot study, Bewley et al recently found the prevalence of illegal drug use to be higher on drug tests than admitted by patients, suggesting a possible under-reporting of drug use by patients who present with delusional infestation to specialist clinics [ref]. It is not known whether the prevalence of illegal substances is more common in the population that presents with delusional infestation compared to the normal population. The prevalence of illegal drug use is relatively well known in many countries. In Germany for example the life time prevalence of any illegal drug use is 25% with less than 5% having consumed any illegal drug in the last 30 days. Dependence or harmful use of cannabis is estimated at 0.5% of German adults, with 0.2% estimated to be addicted to cocaine, 0.1% to amphetamines and a slightly higher number showing signs of harmful use of amphetamines [http://www.drogenbeauftragte.de/drogen-und-sucht/illegale-drogen/heroin-und-andere-drogen/situation-in-deutschland.html]. The World Health Organisation has published substance misuse data for the population aged 15 to 64 using the best available data for each country. The population prevalence for illegal and prescribed opiate use in this group is estimated at 0.32% in Germany, 0.16% in the Netherlands, 5.4% in the United States, and 0.75% in England and Wales. For amphetamines and prescription stimulants the prevalence is estimated at 0.7% in England and Wales, 0.4% in the Netherlands, 1.9% in the United States, and 0.7% in Germany. For cocaine the prevalence is estimated at 0.8% in Germany, 1.2% in the Netherlands, 2.1% in the United States, and 2% in England and Wales. Cannabis use is estimated at 4.5% in Germany, 7% in the Netherlands, 15.4% in the United States, and 6.4% in England and Wales. The World Health Organisation data

[http://www.unodc.org/wdr2015/en/maps-and-graphs.html] normally uses the best available and most recent studies from each of these countries. We used the best and most recent quoted. Updates are not as regular as for example the updates of the German Health Ministry quoted above. Most UN data used in this introduction are from 2009-2013.

In our study we use data from consecutive patients attending specialist clinics in England, Germany (Berlin) and the Netherlands. We also report data from non-consecutive patients from Germany (Ulm, semi-urban) and from Austin, US. The aim of the study is to estimate the prevalence of illicit drug use in the population that attends specialist clinics for delusional infestation.

## Methods

Few specialist clinics exist worldwide for the treatment of delusional infestation. Not all of those clinics test their patients regularly for the use of illegal substances. We have examined a cohort of patients from four centres where consecutive patients have been tested with a urine drugs screen for the use of cocaine, amphetamines, benzodiazepines, cannabis, opioids and methadone. We collected basic demographic data including the sex and age of the patient as well as information about whether the result could be explained by prescribed medication. This has generated prevalence data for each of the substances.

The centres included were: a psycho-dermatology clinic in London led by a dermatologist and a psychiatrist, a clinic in Liverpool led by a consultant of tropical medication and a psychiatrist, a centre in Berlin led by a dermatologist with access to psychiatric liaison and one clinic in Amsterdam led by a dermatologist with access to psychiatric liaison. All of these clinics are tertiary referral centres and accept referrals from a wide geographical area. All centres are free of cost to the patients at the point of presentation. In addition, we present non-consecutive patient data from a clinic in Ulm, Germany led by a psychiatrist with a special interest in delusional infestation and from a dermatologist-led specialist clinic in Austin, Texas, United States.

## Statistical analysis

Plain frequencies and cross-tabulations regarding the prevalence of drug use either prescribed or not, were calculated across age, age categories, gender and sites. Differences in age were tested by means of t-test; the differences across age categories, gender and sites were tested by means of chi-square statistics. Cannabis and benzodiazepines were categorized as soft drugs, amphetamines, cocaine, opiates and methadone were categorized as hard drugs.

Results

Table 1 presents patient characteristics and frequencies of drug use in the consecutive European and the non-consecutive US sample. Table 2 presents the differences of drug use across age categories, gender and sites, whereas table 3 describes the differences between these groups in more detail, per drug and with drugs classed into soft and hard drugs for the consecutive sample.

Table 1 about here.

We had 92 patients in the main consecutive sample the mean age of the patients was 55.6 years (sd=15.9), most patients (59%, n=55) were female. 44 (48%) of the patients were seen in London, 10 (11%) in Liverpool, 16 (17%) in Amsterdam and 22 (24%) in Berlin. 28 patients (30%) tested positive for one drug or another. In 6 cases the positive drug result was explained by prescription medication. This was prescribed benzodiazepines in 5 cases, in one case it was prescribed amfetamines for ADHD. Amphetamines and Cannabis were the most used drugs. In 4 cases patients used both. Benzodiazepines were used by 5 patients.

The other drugs were used less often. Cocaine and methadone were used by one patient, and opiates by two patients. The patient using methadone combined this with the use of benzodiazepine on prescription.

When we relate drug use to the main patient characteristics, we observe that younger patients are more likely to use drugs, as well as a larger number of drugs. This was primarily amphetamines and cannabis. Men were significantly more likely to test positive for drugs than women.

Drug use was highest in the Amsterdam clinic, followed by the Liverpool and London sites. It was significantly lower in the Berlin clinic.

Table 2 and Table 3 about here.

Results from the Ulm site, Germany: a psychiatrist with a specialist interest in the University hospital in Ulm found 8 drug screens performed on 25 patients. 1 was positive for cannabis with a high alcohol level of 2.9 g/l (male, 38 years old). 1 patient tested positive for benzodiazepines which were prescribed (72 year old female). The other results were negative.
Results from the Austin site: In a dermatologist-led specialist clinic in Austin, Texas, we have 92 non consecutive samples. Patients would be referred or self-present and have to pay for services. The Austin data show a very different picture compared to the European sample and compared to drug use statistics in the United States. 40% of the patients tested in Austin were positive for any drug. 50-65 year old patients showed the highest level of drug use (42%), followed by over 65 year olds (34%) and under 50 year olds (24%). Patients with positive results were on average older (mean age 57 versus 52 for no drug use). These differences were not statistically significant. 83% of females tested positive for any drug compared to only 17% of males (p=0.042). The majority of patients tested positive for two drugs compared to only one in the European sample. Only 9 out of all positive drug results could not be explained by prescribed medication. It is very clear that this sample is not representative of drug use in the US. Patients in the US have to pay for a toxicology screen and positive results may have consequences for their insurance cover. It is therefore unlikely that patients agree to drug testing that showed significant illegal drug use. When we compared the two samples statistically, they were not similar and therefore could not be pooled.

## Discussion

Our cohort study of 92 consecutive patients seen for delusion infestation in specialist settings shows the typical distribution for DI of female predominance and more elderly patients [1]. 30% of our consecutive

patients were tested positive for any tested substance. 13% tested positive for amphetamines and cannabis respectively, followed by 8% who tested positive for benzodiazepines, 4% for opiates and 1% for cocaine and methadone respectively. This is much more than what we would expect to find in the normal population. The reasons for this are not immediately obvious. One explanation is that drug induced delusional infestation is still a common phenomenon whose prevalence is under-estimated. Another explanation may be that patients with symptoms of delusional infestation take illicit substances in the hope to relieve their distress. Escamilla et al showed that patients with delusions of infestation were more likely to use narcotics than other dermatologic patients with chronic pruritic skin conditions [5]. This may indicate an attempt to self-medicate.

In keeping with the normal population data, men and younger were more likely to use illicit substances than women and older patients. The much higher rate of substance use has important implications for specialists who see DI patients. Careful exploration of drug use, routine drug testing whenever possible, and an increased awareness of the possibility of illicit drug use are obvious consequences of these findings. Awareness of the possibility of drug use should rise, even when initially unexpected.

It is not clear why DI patients in Amsterdam are much more likely to test positive for drugs than in London, Liverpool or Berlin. Illegal drugs are widely available in all 4 cities. However, our samples are relatively small. There is a possibility that referrals are processed differently and patients in Amsterdam may undergo fewer investigations before being seen in the DI clinic. Ultimately, we would need bigger sample sizes to confirm this finding and more qualitative research to examine the reasons behind it. We also have to consider that our drug screens have a short window to detect drug use, with the exception of cannabis it is less than 4 days. Depending on the day the urine sample was obtained (close after a weekend, early versus late in the diagnostic evaluation) the results may vary.

In the United States it is likely that considerations about payment and consequences for insurance cover are likely to deter patients from agreeing to toxicology screens, especially when they know that the screen will test positive for substances that are not prescribed. It is also possible that despite our best efforts to detect a dermatological diagnosis, some of the patients diagnosed with DI had other secondary medical or psychiatric problems [4]. Since DI is a diagnosis of exclusion,

there is a small possibility for this to affect our data. The high number of older patients with prescribed illicit substances may indicate this to be a possibility in the Austin sample.

The important aspect for dermatologists is to think of drug use, ask questions about current and past use, and ask the patient for a urine sample in order to get a toxicological screen. Patients who refuse should be assumed to possibly take drugs. Because illicit substances, especially stimulants, are a major trigger factor for delusional infestation, patients need to be made aware of this link and encouraged to stop their drug use to see whether that improves their symptoms without the use of additional medication. This may require a referral to local substance misuse services if patients struggle to stop their illicit drug use by themselves.

# Table 1: Frequencies of patient characteristic and drug use

| | | Europe | | Austin USA |
|---|---|---|---|---|
| | N= | | | |
| Total | 92 | | 92 | |
| Age Mean (SD) and range | | 55.6 (15.9) 21-85 | | 54.1 (15.9) 22 – 98 |
| <50 | 31 | 34% | 32 | 35% |
| 50-65 | 30 | 33% | 34 | 37% |
| >65 | 31 | 34% | 26 | 28% |
| Female | 55 | 59% | 25 | 73% |
| Male | 37 | 41% | 67 | 27% |
| Berlin | 22 | 24% | | |
| Liverpool | 10 | 11% | | |
| London | 44 | 48% | | |
| The Netherlands | 16 | 17% | | |
| Any drug use | 28 | 30% | 40 | 44% |
| One drug | 20 | 22% | 15 | 16% |
| Two drugs | 7 | 8% | 23 | 25% |
| Three drugs | 1 | 1% | 2 | 2% |
| Amphetamines | 12 | 13% | 18 | 20% |
| Prescribed amphetamines | 1 | 1% | 13 | 14% |
| Cocaine | 1 | 1% | 0 | 0% |
| Prescribed Cocaine | 0 | 0% | 0 | 0% |
| Opiates | 4 | 4% | 30 | 33% |
| Prescribed Opiates | | | 27 | 29% |
| Benzodiazepines | 7 | 8% | 20 | 22% |
| Prescribed benzodiazepines | 5 | 5% | 20 | 22% |
| Methadone | 1 | 1% | 2 | 2% |
| Prescribed Methadone | 0 | 0% | 2 | 2% |
| Cannabis | 12 | 13% | 1 | 1% |
| Prescribed Cannabis | 0 | 0% | 0 | 1% |

Table 2: Any Drug use compared to background characteristics (European sample only)

| | N= | No drug use | Any drug use | p |
|---|---|---|---|---|
| Europe | 92 | | | |
| Age M (SD) | | 60 (15) | 47 (14) | 0.000 |
| <50 | 31 | 45.2% | 54.8% | 0.000 |
| 50-65 | 30 | 76.7% | 23.3% | |
| >65 | 31 | 87.1% | 12.9% | |
| Male | 37 | 62.2% | 37.8% | 0.150 |
| Female | 55 | 74.4% | 25.6% | |
| Berlin | 22 | 86.4% | 14% | 0.000 |
| Liverpool | 10 | 50% | 50% | |
| London | 44 | 79% | 21% | |
| Amsterdam | 16 | 31% | 69% | |

Table 3 Age, age category, gender and site related to drug use (European sample only)

| | Population total (n=) | | Soft drugs | Cannabis | Benzodiazepines | | Hard drugs | Amphetamines | Cocaine | Opiates | Methadone |
|---|---|---|---|---|---|---|---|---|---|---|---|
| N= | 92 | | 17 | 12 | 7 | | 16 | 12 | 1 | 4 | 1 |
| Age M (SD) | 56.9 | | 48.1* | 46.7* | 47.1 | | 42.1** | 41.08 | 43 | 50.2 | 41 |
| <50 | 31 | | 32%* | 23% | 16% | | 36%** | 26%* | 1 | 1 | 1 |
| 50-65 | 30 | | 10% | 7% | 3% | | 17% | 13% | 0 | 3 | 0 |
| >65 | 31 | | 13% | 10% | 3% | | 0% | 0% | 0 | 0 | 0 |
| Male | 37 | | 16% | 14% | 8% | | 27%* | 22%* | 1 | 2 | 0 |
| Female | 55 | | 20% | 13% | 7% | | 11% | 7% | 0 | 2 | 1 |
| BER | 22 | | 5%** | 0% | 5%** | | 9% | 5% | 0 | 1 | 0 |
| LIV | 10 | | 20% | 20% | 0% | | 30% | 20% | 0 | 1 | 0 |
| London | 44 | | 14% | 14% | 5% | | 14% | 13% | 0 | 2 | 0 |
| Amsterdam | 16 | | 50% | 25% | 25% | | 31% | 18% | 1 | 0 | 1 |

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