REVIEW ARTICLE
Sexual hallucinations during and after sedation and anaesthesia

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Summary
Sexual hallucinations have been reported since the introduction of chloroform. Newer agents such as midazolam and propofol appear particularly prone to producing them. Some practitioners have been the victims of allegations resulting from the hallucinogenic effects of these drugs. Other individuals, including doctors, have used the amnesic effects of midazolam and other drugs to sexually assault victims. Clinicians should be aware of the risks to which they may inadvertently expose themselves if these drugs are not used carefully.

Keywords  Drugs: diazepam, midazolam, propofol. Sexual hallucination.

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One of the most damaging allegations a doctor can face is one of sexual misconduct involving patients. This article reviews the information that became available to one of the authors during an investigation into an allegation of sexual misconduct and a Pubmed search using the search words ‘sexual hallucinations, hallucinations, anaesthesia, propofol, midazolam’. Most of the information is based on case reports in the medical or legal literature, since it is not an area that lends itself to standard scientific study.

History
Sexual hallucinations have been reported since the advent of anaesthesia. Gream [1] reported several instances in 1849 where women had used obscene language under chloroform anaesthesia. As a result, its use was opposed in obstetrics. Simpson [2] repudiated these allegations by stating that chloroform had been in use in Edinburgh for 15 months and he had not heard of any similar reports. However, he cited a French prostitute who had reported lascivious dreams after inhaling ether during her confinement. Simpson concluded ‘but surely it was to say the least very unbecoming that most English women should have sexual dreams (like the French prostitute) when under the influence of chloroform’. Until recently, there have been few reports in the non-English medical literature, perhaps reflecting the differences in reporting mechanisms or social culture.

Benzodiazepines
Case reports of sexual hallucinations following many types of anaesthetic drugs have been published. Benzodiazepines are commonly implicated, but nitrous oxide and propofol in combination with fentanyl or sufentanil have also been involved. In 1984 [3], a male dental surgeon was charged with sexually assaulting two of his female patients. Both had been sedated with 30 mg diazepam and 10 mg midazolam intravenously. After they were sedated, the dentist was alone with the patients for long periods during which the alleged assaults occurred. Despite the dentist’s defence being based on sexual hallucinations being caused by the drugs, he was convicted of indecent assault.

Dundee [4], while carrying out dose–response and pharmacokinetic studies on staff volunteers in the intensive care unit, had a similar incident. A 32-year-old woman, weighing approximately 60 kg was given 30 mg midazolam intravenously. She asked to be withdrawn from the study because of the dreams and fantasies about which she felt embarrassed. She had helped with previous studies and knew that she could not have been subjected
to assault during the procedure ‘although not pressed for exact details she left no doubt that there was a sexual element in this unpleasant experience’.

Dundee [4] also reported that two other similar incidents had been brought to his notice. A middle-aged woman had been sedated with 10 mg midazolam for endoscopy (type unspecified) and on recovery she had told the attending nurse that she had been sexually assaulted (oral sex) during the procedure. It was difficult to assure her that this was impossible. Another 52-year-old woman who was sedated with intravenous diazepam and underwent cholecystectomy under epidural analgesia claimed she had been sexually assaulted. While this could not have happened, the only possible interference with her genitalia was when a swab was placed between her thighs to prevent possible irritation by surgical spirit.

Dundee went on to report a series of ‘about’ 600 patients undergoing ‘oral’ endoscopy under sedation who were questioned about similar events; two recalled definite sexual experiences while a further two reported distressing experiences of a non-sexual nature. Midazolam (10–15 mg) had been used for sedation in both these patients. In another section of the same paper, six out of 200 women undergoing minor gynaecological procedures in whom midazolam 0.3–0.5 mg kg\(^{-1}\) was used for induction of anaesthesia, had sexual fantasies, all of which were considered pleasurable. Patients undergoing dental procedures also experienced hallucinations (midazolam dosage not reported). One woman claimed that the dentist had asked her to squeeze his penis while two others thought the operator had oral sex with them. None of these events could have occurred, since witnesses were present in all instances.

Two more incidents were reported in the same paper; one where a patient had a change of dressing under sedation and complained of a ‘wandering hand’. In the second, a sedated patient in the intensive care unit, complained her breasts were regularly fondled. By 1989, Dundee knew of 42 pending cases of sexual allegations [5]. The complainants, aged 18–49 years had undergone oral surgery, laryngoscopy and tracheal intubation or upper gastrointestinal endoscopy. In most instances, the presence of witnesses meant that the claims could be dismissed as drug-induced fantasies, but in some cases where there were no independent witnesses, the allegations were difficult to refute [5,6].

Litchfield [7] studied the effects of intravenous diazepam (5–50 mg, average 20 mg) on 16 000 patients. He found that hallucinations occurred in 1.3% of 2470 patients given a questionnaire. The psychological side-effects were dose related and were up to 50% more common in females than in males in patients aged over 20. Although he did not report how many hallucinations were of a sexual nature, he detailed two case reports ‘to illustrate the type of things that had happened on several occasions in the experience of the author’.

A 35-year-old woman received 20 mg diazepam for restorative dentistry. Before the injection she had seemed normal, but as soon as the injection was given, she began talking about a difficult domestic situation and often referred to the problems she had at home with her husband. She was given methohexitone as supplemental sedation but as soon as it began to wear off she resumed talking about her domestic problems in a quite distressed manner. This continued into the immediate postoperative period.

The second patient was a 38-year-old woman who received 30 mg diazepam and 150 mg methohexitone for restoration of 25 teeth. The operation and recovery were uneventful. However the patient did not return for follow-up. On inquiring, she had reported to the secretary that she was dissatisfied with the treatment and the dentist’s behaviour but would not give details. Eventually she asked to see the dentist and mentioned ‘her dissatisfaction related to her being molested in the upper part of her body during the operation’. This was denied and she was informed that a nurse was in the surgery during the whole operation and that drugs such as diazepam could cause hallucinations. She finally accepted this explanation. The report also mentioned the proximity of instruments to her chest and the fact that instruments are often wiped on the napkin on the chest. This may have some bearing on the origin of these hallucinations.

In 1986, a doctor in an emergency department near Ottawa, Canada, was accused of placing his penis in the hands of a patient recovering from an intravenous dose of benzodiazepine [8]. The doctor mentioned that he had been testing her ability to respond to a command by asking her to squeeze two fingers of his hand. He was acquitted at the criminal trial; however, the College of Physicians and Surgeons of Ontario found him guilty of disgraceful and unprofessional conduct and he lost his licence to practice.

In 1990, a dentist was acquitted of assaulting seven women who had been given diazepam sedation [9]. The judge directed the jury to return a verdict of not guilty on the basis of Dundee’s findings that 1 in 200 women given large doses of benzodiazepines experience sexual fantasies [4–6,9].

In another case in 1990, a Manchester dentist was investigated by the police following a complaint of sexual misconduct [10]. During the investigation, a further three complaints were discovered. He was prosecuted for allegedly assaulting four women while they were sedated with midazolam. The dentist was convicted on two counts on majority verdicts. In the judge’s summary of evidence, there is no mention of sedative dose. Following this, there were another 15 reports in the medical and
dental literature of sexual hallucinations. Some of these were reports made by the dentists while others were the subject of a complaint by the patient. None of these were reported to police or formed part of a formal complaint. M = male, F = female [10].

In 1993, a plastic surgeon was tried at Oslo High Court for alleged sexual assault (vaginal masturbation) on nine patients while performing mammoplasty under sedation with midazolam, and in some instances combined with fentanyl [11,12]. The combination of midazolam with fentanyl have synergistic hypnotic effects and the same may be true for their psychological effects. The surgeon was acquitted, as a female nurse was present throughout the procedures.

In 1996, a male anaesthetist appeared before the General Medical Council to answer four counts of alleged sexual misconduct with female patients. One occurred in the recovery room, with the patient alleging that the anaesthetist had fondled her breasts. This was possibly related to recovery from anaesthesia and the removal of ECG electrodes. Two other episodes occurred in the patients’ rooms when the anaesthetist visited them alone after a minor procedure involving midazolam. Both patients alleged penile masturbation. The fourth incident occurred when the anaesthetist was alone with a young woman in the anaesthetic room who had received a guanethidine block for pain. Midazolam was used to sedate her. The anaesthetist allegedly fondled her genitalia after the release of the tourniquet. The defence claimed that the tourniquet release at the end of a guanethidine block is associated with a vaginal thrill and this led to the hallucination. The allegations were upheld in the last three instances and the anaesthetist erased from the register.

### Propofol

There are several case reports of sexual hallucinations after propofol [13]. In one, a 20-year-old woman related in explicit detail her sexual encounters with her former boyfriend while being sedated with propofol (60 mg) during a spinal injection for treatment of chronic pain. In another, a 47-year-old woman patient who was having a tunnelled epidural catheter placed under sedation with propofol (70 mg) described the tattoo in her groin and expressed the desire for those present to see it.

In 1988, Hunter and colleagues [14] reported five separate incidents of sexual arousal after propofol and alfentanil anaesthesia for minor gynaecological procedures.

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**Table 1** Reports by dentists in the medical and dental press of sexual hallucinations after a Manchester dentist was convicted for sexual assault on two patients. None of these were reported to police or formed part of a formal complaint [10] (Table 1).

<table>
<thead>
<tr>
<th>Sex of patient</th>
<th>Sex of dentist</th>
<th>Age of patient</th>
<th>Drug</th>
<th>Observation by dentist</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>F</td>
<td>20</td>
<td>Diazepam</td>
<td>Masturbation</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>Unknown</td>
<td>Diazepam and pentazocine</td>
<td>Grabbed dentist</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>30</td>
<td>Nitrous oxide</td>
<td>Sexual excitement</td>
</tr>
<tr>
<td>M</td>
<td>F</td>
<td>9</td>
<td>Nitrous oxide and halothane</td>
<td>Acted like a baby and sexual comments</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
<td>48</td>
<td>Diazepam</td>
<td>Masturbation</td>
</tr>
<tr>
<td>M</td>
<td>F</td>
<td>25</td>
<td>Diazepam</td>
<td>Masturbation</td>
</tr>
<tr>
<td>M</td>
<td>F</td>
<td>30</td>
<td>Diazepam</td>
<td>Masturbation</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
<td>20</td>
<td>Midazolam</td>
<td>Masturbation</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>22</td>
<td>Midazolam</td>
<td>Masturbation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex of patient</th>
<th>Sex of dentist</th>
<th>Age of patient</th>
<th>Drug</th>
<th>Complaint by patient or relative</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>M</td>
<td>18</td>
<td>Nitrous oxide</td>
<td>Saw dentist naked</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>42</td>
<td>Diazepam</td>
<td>Increased sexual appetite</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>30</td>
<td>Diazepam</td>
<td>Felt breasts kissed and fondled</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>Unknown</td>
<td>Brietal, nitrous oxide and halothane</td>
<td>Rape</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>18</td>
<td>Brietal and atropine</td>
<td>Sexual dream</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>25</td>
<td>General anaesthetic</td>
<td>Sexual affair</td>
</tr>
</tbody>
</table>
Young [16] reported a case in which a young woman anaesthetised with propofol for an orthopaedic procedure spent the next half-hour shouting for her orthopaedic surgeon in an amorous manner. In a series of 40 male patients in whom anaesthesia was induced by a woman anaesthetist and specifically questioned about dreams afterwards one patient admitted to dreaming about the anaesthetist, but refused to elaborate [17].

Finally, Canaday [18] reported a 48-year-old, 75 kg man with end-stage renal disease who was admitted to hospital with presumed sepsis from an infected haemodialysis shunt. He was being treated with antibiotics and on the eighth day of his hospital stay had a temporary dialysis catheter placed in the left internal jugular vein under sedation with propofol (50 mg given over 15 min). After returning to the ward, about two hours later, he was found standing in his room making inappropriate sexual comments. He was led back to bed, but continued to make sexually explicit comments and in addition he threw off his bedclothes, exposing himself to the staff. The episode lasted about 10 min Subsequently the patient was quiet, co-operative and orientated and stated that he ‘felt great’. However, another two hours later while undergoing regular haemodialysis treatment he again became disoriented and made advances to the attendant female staff. This episode lasted about five minutes. He had two further episodes about 10 and 12 h later and needed 4 mg haloperidol intramuscularly to control him. A few hours later he said he felt well and had no recollection of his aggressive behaviour. No further inappropriate behaviour was seen.

**Nitrous oxide**

Nitrous oxide in concentrations greater than 50% has also been implicated in producing sexual hallucinations and arousal in nine patients [19]. However, Bennett [20] has questioned the validity of nitrous oxide hallucinations and claimed that most are an excuse for dentists to sexually assault their patients, stating ‘unfortunately, husbands witnessing such dentist-patient “relations” did not experience similar fantasies…’. He also states that he was aware of 38 cases of ‘nitrous oxide hallucinations’ and three dentists serving prison sentences for sexually assaulting patients.

**Intensive care**

Hallucinations occur commonly in the critically ill; sedation and the severity of disease may cause many of these. In a recent audit of patients followed immediately after intensive care discharge, almost one quarter of patients suffered from nightmares, dreams and hallucinations, some of which were of a sexual nature (G. R. Park, unpublished observations). All caused great distress to the patients. One patient, returned to the intensive care unit three years later seeking advice, complaining of rape and buggery which could be traced to a high vaginal swab and rectal temperature probe. During these three years her marriage and job suffered and after appropriate counselling she improved.

**Discussion**

Sexual hallucinations can occur during sedation or anaesthesia with a wide range of psychotropic drugs. They may be related to a stimulus that in itself may be trivial and entirely appropriate. Physical stimuli such as wiping instruments on the chest and blood pressure cuffs have been implicated in the origin of these hallucinations. Often the patients’ experiences were vivid, the sequence of events orderly and real. They were often surprised when the true nature of their experience was explained to them.

Certain physical stimuli seem more prone than others to cause sexual hallucinations. Stimuli to the chest such as removal of ECG electrodes, elbows rubbing the chest while the operator is working in the mouth or on the face have resulted in accusations of breast fondling. Similarly, swabs placed in the perineum have resulted in accusations of genital manipulation. The rhythmic inflation and deflation of a blood pressure cuff, and the squeezing of a rubber ball to make veins more prominent have resulted in allegations of penile masturbation. These tactile stimuli resulting in hallucinations are easy to understand but the influence of auditory and visual stimulation is more difficult to elucidate.

Most of the serious hallucinations that resulted in an investigation involved women patients and male dentists or anaesthetists. However, male patients also have similar, albeit less frequent hallucinations. Many of the reports of hallucinations have originated from northern European countries with few from southern Europe, perhaps representing a cultural difference.

Not all the hallucinations were dismissed when investigated by criminal courts and disciplinary bodies. In addition, there continues to be regular reports in the press of ‘date rape’ with flunitrazepam [21]. Undoubtedly, some practitioners have used the amnesic and psychological effects of these drugs to sexually assault their patients [8]. In the absence of physical evidence, it may be difficult to differentiate assault from hallucinations.

Clinicians using the drugs need to be aware that hallucinations do occur and to protect themselves against allegations of sexual misconduct when using these drugs. It is also important to realise that these hallucinations
Sexual hallucinations do occur with many of the hypnotic drugs used by anaesthetists and others. To the patient they are real and frightening. They may be reported to the authorities that may then investigate the anaesthetist. Even though the events may eventually be shown to be hallucinations, they may damage both the patient and the doctor. When using these drugs chaperones should be present so that when an allegation is made they can be shown to be hallucinations. Unfortunately, some doctors use these drugs to sexually assault their patients. This makes it difficult for external authorities to determine exactly what happened.

All hallucinations must be taken seriously. The patient is likely to be distressed. A full explanation of the cause must be offered, along with reassurance that there was a chaperone present. Despite this, patients often find this difficult to accept because of the very real nature of these hallucinations. Prolonged counselling may be needed. Any interview with a patient who has suffered sexual hallucinations should be witnessed. Keeping meticulous records of events while under sedation or anaesthesia is a further defence. Dealing with complaints promptly and seriously will not only help the patient but also prevent matters escalating. In addition, early contact with a medical defence union for further advice and support is important.

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References