

Sleep, Dreams and Sleepwalking: the medico-legal importance

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Introduction

Sleeplessness, a sleep disorder – often called insomnia - is of two types: primary and secondary. In primary insomnia no cause is identified, but secondary insomnia can be due to anxiety, depression, overweight, sleep apnoeas, working shifts, vigorous physical exercise near bed time, evening consumption of alcohol, coffee or nicotine, pain or serious respiratory conditions. A related condition is parasomnia which includes sleep walking, sleep talking and restless leg syndrome. Sleep walking is also known as somnambulism. Sleep walking when associated with sexual behaviour is known as sexomania or somnambulistic sexual behaviour. We have previously reported this case - the first case of somnambulistic sexual behaviour associated with transmission of Chlamydia and genital warts in the UK¹ – and here expand on some of the issues raised by it.

Case report

A 13 year old girl attended the GUM clinic complaining of vaginal discharge and genital warts. Examination confirmed genital warts. Cervical swabs confirmed that she also had Chlamydia. She did not have a regular sexual partner and had had sex with one person. On detailed questioning by the police she revealed that her step brother has been abusing her since her age of nine. The abuse initially started with digital penetration but had recently changed to actual sexual intercourse with full penile penetration. He was addicted to alcohol, taking about 30-40 units a week but was otherwise fit and well. There was no other history of recreational drug taking and he was not on any medication. On examination he was found to have several tiny warts on the shaft of his penis and an endo-urethral swab was positive for *Chlamydia trachomatis* by nucleic acid amplification test (NAAT). Testing for *N.gonorrhoeae* was

negative.

On police questioning, he denied any knowledge of abusing or having sexual intercourse with the 13 year old girl. Subsequently it transpired that he was abusing her whilst asleep. There was no family history of sleep walking. Expert advice was sought by the Police on acquiring Chlamydia and genital warts. The advice was that this was a case of sex associated with sleep walking – sexomania. The case was therefore dropped as sexomania is not a criminal offence.

In this case the victim was only 13. According to the Children Act 1989 the minimum age of consent to sex is 16 in England, Wales and Scotland (it is 17 in Northern Ireland). The Sexual Offences Act (SOA), 2003 created a new law that there is no defence of consent where the sexual activity involves a child under the age of 13². Between the ages of 13 and 16 it should be possible to detect the difference between consensual and non-consensual sexual behaviour and act appropriately according to BASHH (British Association for Sexual Health & HIV) guidelines. Every area in UK has a Local Safeguarding Children Board (LSCB) whose function is to ensure the principle “the interest of the child is paramount”. There is a child protection service attached to every hospital with designated personnel. The duty of the doctor is to liaise with them on child protection issues. Under the protocols issued by the area Child Protection Committee in England and Wales it is mandatory to report to the police all sexual activity involving those under the age of thirteen³.

Sleep and insomnia

Sleep is defined as a state of unconsciousness from which a person can be roused. By contrast, coma is a state of unconsciousness from which one can not be roused. A person who does not

get enough sleep suffers from insomnia. This is defined as a complaint of difficulty in initiating or maintaining sleep that lasts at least one month and becomes clinically significant, causing distress or impairment in social, occupational or other important areas of functioning⁴.

We all need sleep for normal physical and mental wellbeing. We spend a third of our lives asleep. By the age of 75 the average person will have slept for 25 years! Fetuses sleep and dream in the womb. Babies sleep 50% of the time. Adolescents sleep for 11-12 hours. Adults sleep an average of 7.5 hours. Older people over 70 usually sleep for less than six hours.

Depression is the commonest cause of insomnia. Sleep disorders can be diagnosed in the laboratory by a technique called polysomnography

The following prevalence of sleep disorder was noticed in a polysomnographic study;

	Male	female
No sleep disorder	49.9%	64.7%
Mild sleep disorder	33.2%	24.5%
Moderate sleep disorder	15.7%	7.9%
Severe sleep disorder	8.2%	3%

Thus sleep disorders are commoner in males.

The Epworth sleeping scale is often used to diagnose sleep disorders clinically. According to this scale if a person never dozes or sleeps in a particular situation the score is 0, if there is slight chance of sleeping or dozing the score is 1, moderate chance of sleeping and dozing the score is 2 and high chance of sleeping and dozing the score is 3.

The following situations are taken into account with a score of 0-3 for each:

1. Sitting and reading
2. Watching TV
3. Sitting inactive in public places

4. Being a passenger in a car for more than one hour without break
5. Lying down to rest in the afternoon
6. sitting and talking to someone
7. sitting quietly after a lunch without alcohol
8. sitting in a car while stopped for few minutes in traffic

If the total score is 9 or more the person suffers from sleep disorder

Adults need an average of 7.5 hours of sleep. Some people who have a mid day sleep may need as little as 4 hours of sleep overnight, but without adequate sleep they become irritable, easily distracted, suffer from hypomania and sometimes delusions of grandeur.

Sleep efficiency is the ratio of sleeping time and time spent in bed. For example if one sleeps six hours and spends nine hours in bed the sleep efficiency is 66%. The normal sleep efficiency is 80-85%. If it is less than 75% this is classed as poor quality sleep and more than 90% is sleep deprivation

To promote good sleep hygiene one should take caffeine and alcohol in moderation, sleep in a regular pattern in a suitable environment and avoid medications like diet pills and antidepressants. When promotion of good sleep hygiene does not work the next step is non drug treatment with cognitive behavioural therapy (CBT) or relaxation therapy. For CBT the person needs to be referred to a psychologist. If this fails then one should consider drug therapy. The drug of choice is one without dependence - N-acetyl-5-methoxytryptamine (Melatonin). This is licensed in the UK and marketed as Circadin (2mg melatonin). It is only indicated for insomnia over the age of 55.

Other drugs like benzodiazepines, anti depressants, and sedative antihistamines can be given. "Z" drugs like zopiclone, zoleplon and zolpidem are also useful.

Obstructive sleep apnoea in adults.

This is a condition characterised by snoring, apnoeas and arousal⁵. In this situation when breathing stops for a brief period, CO₂ builds up in the blood which stimulates the respiratory centre of the brain. The person starts breathing again and wakes up. It is common in obesity, hypertension, hyperlipidaemia, insulin resistance and type 2 diabetes. It increases the risk of motor accidents seven fold. It is usually diagnosed by polysomnography and Epworth Sleepiness scale as described above. The treatment is - according to NICE guidance - positive airway pressure in severe cases and in mild cases, weight loss, mandibular devices and ENT surgery.

Paediatric obstructive sleep apnoea.⁶

This condition differs from adult obstructive sleep apnoea in clinical features and management. In the UK the incidence of habitual snoring among children is about 12% whereas the prevalence of obstructive sleep apnoea is 0.7-1.8%. In the USA the incidence is about 15.5% with a prevalence rate of sleep apnoea of 1.2%. In this condition disordered gas exchange and frequent arousal from sleep are noticed. Neuro-behavioural consequences are common among children. There are three groups of children in this category i.e. group 1 - hypertrophy of adenoids and tonsils between age 3 and 6 years; group 2 - obesity; group 3 - congenital abnormalities. Usually these cases in children are managed jointly by paediatricians and ENT surgeons⁶.

DVLA advice and sleep disorders

The Driver and Vehicle Licensing Agency (DVLA) reports that a fifth of motorway accidents are due to falling asleep at the wheel. It is very common among 18-30 year olds who drive late at night. Excessive tiredness like shift work and late driving can contribute to this. Eating a large meal, taking drugs or alcohol can cause accidents. Medical conditions like obstructive sleep apnoea, Parkinson's disease,

multiple sclerosis and motor neurone disease can all cause accidents related to sleeping.

Sudden daytime sleep which is uncontrollable and compulsive is very important. This condition is called narcolepsy. Cataplexy is where there is sudden loss of muscle tone of voluntary muscles usually associated with emotions. DVLA warns that in these situations one should not drive. There is always a warning sign before falling asleep at the wheel. One should take necessary steps at this stage to prevent accidents.

Dreams

It is said that the dreams keep the brain entertained whilst the body asleep. They are the cinemas of the mind where the brain creates junk movies that are entertaining but mean little and best forgotten.

The reality of dreams is that they last an average of 5-30 minutes. We dream every 90 minutes at night. Thirty three per cent of dreams convey misfortunes, 25% take place in known locations and 50% contain aggression towards the dreamer. We forget 95-99% of dreams⁷.

There is a Dream Bank at the University of California, USA. They analysed 22000 dreams and produced three theories of the purpose of dreams -

1. They are random images created by brain as it re-works on the previous day's events
2. The brain keeps itself occupied with home-made movies while the body sleeps
3. A survival strategy to learn how to survive against hostile events. Dreams can foretell the future.

It was said that Napoleon was guided by his dreams⁷.

Sleepwalking (Somnambulism)

This is common in children affecting 7-8%, but is less common in adults, affecting about 2.5%. Out

of all forms of sleep walking, 4% are associated with sexual behaviour. Any action during sleep walking is not intended and the person does not remember anything when he awakes. Actions during sleepwalking (even if undesirable) cannot therefore be criminal in law.

Sleepwalking is also known as nREM sleep parasomnia as it is associated with non-rapid eye movement (nREM). Sleepwalking is mostly familial and is often drug-induced - usually alcohol⁸. Sexual behaviour while sleep walking can include normal vaginal penetration, oral and anal sex⁹. Atypical sexual behaviours can include violent masturbation, sexual assaults and loud sexual vocalisation⁹.

Medico-legal importance of sleep walking

Sleep laboratory assessments with electroencephalogram and polysomnogram show that the brain has alpha, beta, theta, mu, gamma, vertex, spike and k waves. The delta waves are mostly implicated with sleepwalking. During the whole sleep period in an adult the nREM sleep alternates with REM sleep every 90 minutes. The whole 90 minutes sleep period has 5 stages with four nREM and final REM stage. In stage 1, brain waves are smaller, slower and irregular. This lasts for only ten minutes. The person can easily be awakened. The person may even deny having ever slept. In stage 2, the brain waves are larger and the metabolism slows down. Only sound can wake him up. It last for 20 minutes. In stage 3, the delta waves are five times larger and only a loud noise will rouse. In stage 4, deep sleep starts. It is difficult to wake the person in this stage. If he wakes he is confused and disoriented and the legs often paralysed. In this stage 4 nREM sleep walking, bed wetting, visible dreams and nightmares are common. The fifth stage starts with REM as short REM for 10 minutes and finally after 10 minutes proper REM takes over. In the REM stage the breathing rate is high, irregular and the heart rate rises, the legs are fully paralysed and vivid dreams appear.

In the whole period of sleep there are 4-5 cycles both nREM and REM.

A man was prosecuted for indecent sexual exposure as he was walking naked. When it was known that he was sleep walking the case was dropped¹⁰. In December 2005 a 33 year old man was prosecuted for sexual assault but acquitted after it was confirmed by a medical expert that he was sleep walking at the time¹¹. In the same year a man called James Bilton raped a woman of 22 years of age three times but was acquitted as he was sleep walking¹².

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