Psychological disturbance associated with recurrent abnormal nocturnal events

Sleep-related abnormal nocturnal events (parasomnias) are common and linked with psychological disturbance in various ways. If not realized, this can lead to mistaken diagnosis and treatment. Possible origins of such psychological disturbance are discussed, with the aim of improving clinical care.

The adverse effects of sleep loss are well documented but mood and behavioural changes associated with the parasomnias are generally less often considered. This review summarizes examples of these changes and their possible origins. A more detailed account is available elsewhere (Stores, 2013). Thorpy and Plazzi (2010) provide comprehensive accounts of parasomnias in general.

The International Classification of Sleep Disorders (ICSD-3) (American Academy of Sleep Medicine, 2014) defines parasomnias as undesirable physical events or experiences that occur during entry into sleep, within sleep, or during arousals from sleep. They may occur during non-rapid eye movement sleep, rapid eye movement sleep, or during transitions to and from sleep. Clinical manifestations can involve abnormal sleep-related complex movements, behaviours, emotions, perceptions, dreams and autonomic nervous system activity.

Parasomnias can result in injuries, disruption of sleep, adverse effects on health and psychosocial difficulties. It seems that over 30% of individuals experience a parasomnia at some time in their life (Ohayon, 2010).

Parasomnias can be primary (i.e. primary sleep phenomena) or secondary in being manifestations of medical or psychiatric disorders. Rapid eye movement sleep behaviour disorder, for example, can belong to both these categories. Of the many parasomnias officially recognized in ICSD-3 some are subtle but others are dramatic.

Table 1. Ways in which mood and behavioural changes may be associated with parasomnias

Clinical manifestations
As a result of comorbidity with other sleep disorders and medical conditions or psychiatric illness of which parasomnias can be symptomatic
Medication effects
Resulting from the effects of sleep disruption and poor quality sleep caused by parasomnias or comorbid conditions
Arising from the reactions of patients to their parasomnia experiences and reactions of those witnessing the episodes
As a consequences of misdiagnosis and mismanagement of parasomnias

Correct recognition and diagnosis of the type of parasomnia (on which choice of treatment depends) requires detailed clinical description of the episodes. Polysomnography with audiovisual monitoring may be required when the nature of the episodes remains unclear. Natural history and appropriate treatment varies from one type of parasomnia to another.

People with parasomnias may be subject to mood and behavioural disturbances in various and possibly combined ways (*Table 1*). Identifying the origin(s) of these psychological effects can suggest ways of preventing or lessening such effects.

Mood and behavioural changes as part of the clinical manifestations of parasomnias

Non-rapid eye movement parasomnias: arousal disorders

Clinical features of these sleep disorders include behavioural changes which can cause surprise or disbelief in those unfamiliar with the range and nature of behaviours possible during sleep. Arousal disorder episodes seem to combine features of simultaneously being both asleep and awake.

Sleepwalking, sleep terrors and confusional arousals are the three basic types of arousal disorder. Episodes usually occur in the first part of the night when most deep non-rapid eye movement sleep occurs. Each tends to end spontaneously after a relatively short period. Although the patient may appear alert during the episode, typically he/she shows little or no response when spoken to because he/she remains asleep. Forceful attempts to intervene may meet with resistance and increased agitation.

Sleepwalking

Sleepwalking often consists of calmly walking about in a semi-purposeful manner, mumbling or talking incoherently. However, sleepwalking can also take an agitated form in which (as in sleep terrors) the patient appears to be very fearful and distressed, rushing about and crying out as if escaping from danger.

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Sleep-related eating disorder is a form of sleepwalking in which meals may be prepared, sometimes with excessive weight gain as a result of the amount of often highly calorific food eaten at night while still asleep. Non-edible and even toxic substances may be consumed. Sexual or other serious offences also may be committed as part of a parasomnia. The term 'sexomnia' was introduced to refer to sexual behaviour during sleep. Of the various sleep disorders implicated in sexomnia, confusional arousals and sleepwalking are the most common (Schenck et al, 2007).

Sleep terrors

These occur mainly in later childhood but can persist into adult life. The patient appears terrified, with staring eyes, intense sweating, rapid pulse and crying out suggesting intense distress which is apparent rather than real because he/she remains asleep. In both sleepwalking and sleep terrors there is a risk of accidental injury, e.g. from falling down stairs or climbing through bedroom windows. If the person awakens at the end of the episode, he/she may describe feelings of primitive threat or danger, but not the extended narrative of a nightmare.

Confusional arousals

Confusional arousals occur mainly in infants and toddlers. Episodes may begin with movements and moaning before progressing to agitated and confused behaviour with perhaps intense crying, calling out or thrashing about.

The term 'confusional arousal' is also used regarding adults in the context of other sleep abnormalities, e.g. hypersomnias (such as narcolepsy and idiopathic hypersomnia), circadian sleep wake cycle disorders or obstructive sleep apnoea.

Sleep-related violence

Sleep-related violence can occur not only in arousal disorders but also in rapid eye movement sleep behaviour disorder, some forms of sleep-related epilepsy such as nocturnal frontal lobe epilepsy, and also confusional states at night caused by various medical conditions or psychiatric states (Siclari et al, 2010).

Rapid eye movement parasomnias

These tend to occur later in the night when rapid eye movement sleep periods (in which most dreaming occurs) are most prominent.

Nightmares

Nightmares are dreams that usually awaken the sleeper in a distressed state. They consist of a frightening or otherwise upsetting sequence of dream events (i.e. a narrative), the distressing effect of which increases as the dream events unfold until the patient wakes up frightened, alert and able to describe the dream experience. The distress may persist for a while, making it difficult to return to sleep for some time despite reassurance.

In early childhood nightmares may include monsters and, later, frightening TV or film content, events at home or upsetting experiences at school. Adult themes include being pursued, trapped or threatened in other ways. In post-traumatic stress disorder nightmares the traumatic experiences may be re-lived.

The term 'nightmare' can cause diagnostic mistakes when used for any type of dramatic nocturnal episode in which the patient appears to be very frightened. For instance, 'nightmare' and 'sleep terror' are sometimes used synonymously despite their differences in aetiology, timing, significance, treatment requirements and prognosis.

Rapid eye movement sleep behaviour disorder

In rapid eye movement sleep behaviour disorder the normal paralysis of the skeletal musculature in rapid eye movement sleep is lost, allowing dreams to be enacted (Mahowald and Schenck, 2009). If the content of the dreams is violent, the patient may punch, kick, leap out of bed, or run about, possibly shouting, crying out or swearing with the risk of self-injury or injury of anyone else nearby. Rapid eye movement sleep behaviour disorder occurs mostly in elderly males but cases in people of both sexes and all ages (rarely including children) have been reported.

Some cases of rapid eye movement sleep behaviour disorder seem to be idiopathic although, increasingly, the term 'cryptogenic' is preferred because an underlying condition might well eventually come to light. Rapid eye movement sleep behaviour disorder is strongly associated with neurodegenerative disorders and also narcolepsy. It may precede the development of Parkinson's disease (perhaps by many years), otherwise it can develop after its onset. A prodromal period, possibly over months or more, has also been described consisting of persistent sleep talking, loud vocalizations, and limb twitching or body jerking.

Sleep paralysis is considered shortly.

Parasomnias during transitions to and from sleep

People with the following common benign parasomnias may mistakenly fear that they have a neurological or psychiatric disorder.

Hypnic jerks

These are sudden jerks of the limbs or other parts of the body when going to sleep. Flashes of light, a loud bang, crack or snapping noise, sudden pain or other unpleasant sensation occur in the exploding head syndrome.

Hypnagogic hallucinations

Hypnagogic hallucinations may accompany hypnic jerks, but often occur separately. They consist of a combination of a dream-like state in which objects (including people or animals) may be seen, heard, felt, smelled, tasted or distorted. Personal body image may seem altered. When

they form part of the narcolepsy syndrome they can be particularly intense and terrifying. Their counterparts on waking are called hypnopompic hallucinations.

Recurrent isolated sleep paralysis

Recurrent isolated sleep paralysis (as distinct from sleep paralysis associated with narcolepsy) consists of recurrent brief episodes of inability to move or speak when going to sleep or on waking up, usually from a dream. Consciousness is preserved and eye movements are possible but, although respiratory movements are spared, there is a sensation of not being able to breathe. Episodes end spontaneously or on being touched or moved. Sleep paralysis can be particularly alarming if combined with complex hallucinatory phenomena. The overall experience can be so bizarre (including conversations with people or other beings, as well as feelings of threat, dread or alien presence) that a psychotic illness may be mistakenly suspected (Stores, 1998). Otherwise, attention seeking might be misdiagnosed.

Restless legs syndrome

Strictly speaking, restless legs syndrome (Allen, 2014) is a sleep-related movement disorder. Adults with this condition complain that, especially when resting mainly in the evening in the pre-sleep period or on waking at night, they recurrently feel compelled to move their legs in which they experience very uncomfortable feelings. Children (in whom restless legs syndrome may be the explanation of some cases of 'growing pains') may refer to 'creepy-crawly' feelings. Walking or otherwise moving the legs provides some relief from this distressing experience. Restless legs syndrome cannot be considered benign as it can be associated with organic pathology, notably iron deficiency.

Psychological disturbances resulting from co-existing sleep disorder, and medical or psychiatric illness

Some parasomnias co-exist with other sleep disorders, or are symptoms of a medical or psychiatric condition. In such cases, mood and behavioural changes can be a combination of the effects of the parasomnia itself and those of the comorbid condition(s).

Comorbid sleep disorders

Obstructive sleep apnoea illustrates how one sleep disorder can be associated with others or confused with them. The features of obstructive sleep apnoea-induced arousals can include complex and even violent behaviours and be clinically difficult to distinguish from arousal disorders, rapid eye movement sleep behaviour disorder, nocturnal seizures or dissociative states. Obstructive sleep apnoea can increase seizure frequency in people with epilepsy whose seizure control may improve with treatment of their obstructive sleep apnoea (Vaughn and D'Cruz, 2003).

Comorbid medical disorders

Examples in which often dramatic behaviour forms part of the clinical manifestations include sleep-related seizures (classifiable as secondary parasomnias). These include benign Rolandic (centro-temporal) seizures (a common form of childhood epilepsy), the features of which include abnormal facial movements and sensations, and difficulty speaking, all of which can alarm children and their parents.

Nocturnal frontal lobe epilepsy has been described mainly in adults but also in children. Seizures often include dramatic motor automatisms such as kicking, hitting, rocking, thrashing, and cycling or scissor movements of the legs. Accompanying vocalizations may consist of grunting, coughing, muttering, moaning, shouting, screaming or roaring. Such episodes can be associated with impairment of consciousness; if not, they will be distressing.

Other parasomnias of medical origin (Zucconi and Oldani, 2010) which can entail emotional disturbance as part of their clinical manifestations include fearful or uncomfortable awakenings caused by respiratory disorders such as obstructive sleep apnoea or asthma, gastro-oesophageal conditions (reflux or spasm), and various types of sleep-related headaches, e.g. forms of migraine or cluster headaches both of which can cause much distress. Parasomnias associated with Parkinson's disease include vivid dreams or nightmares, hallucinations, arousal disorder episodes and panic attacks.

In the elderly disruptive behaviour at night, with confusion, wandering, agitation or even violence, might be the result of a parasomnia such as an arousal disorder or rapid eye movement sleep behaviour disorder (Leu-Semenescu and Arnulf, 2010). The risk of mood and behavioural disturbance is increased in the presence of any neurodegenerative disease or other medical conditions to which the elderly are particularly prone.

Psychiatric disorders

Anxiety states, depressive disorders and bipolar disorder are reported to be associated with sleep terrors, confusional arousals and sleep-related hallucinations. Nightmares are a feature of post-traumatic stress disorder and acute stress disorder (Ahmed and Thorpy, 2010).

Panic attacks can co-exist with daytime panic attacks or occur exclusively at night. They are characterized by sudden awakening in a state of high autonomic arousal, often with the fear of an impending heart attack or stroke.

In sleep-related dissociative states apparently impaired awareness and memory (and possibly disturbed behaviour) occur for psychological rather than physical reasons (Mahowald et al, 2011). In some cases, dramatic behaviour, sometimes bizarre or violent, occurs at night but while the patient is awake rather than asleep as shown by polysomnography. Similarly, episodes while awake resembling sleepwalking or epilepsy have been reported in both

adults and children. In such cases malingering (i.e. pretending) has to be considered as an alternative to psychiatric disorder.

Medication effects

Medications capable of affecting mood and behaviour in parasomnia patients may be drugs used for parasomnias themselves or for the various comorbidities just discussed. The following are examples.

Benzodiazepines have been used to treat particularly troublesome arousal disorders. Side effects, including those affecting mood and behaviour, are considered to be largely avoidable by using small doses over a strictly limited period. Clonazepam can be particularly effective in most cases of rapid eye movement sleep behaviour disorder, usually without serious complications, although reported psychological effects include excessive sleepiness, confusion and memory impairment as well as those following onset or worsening of sleep apnoea (Aurora et al, 2010).

Many types of medical treatments, such as those for cardiovascular disorders, Parkinson's disease and epilepsy, can affect mental state including those causing mood and behaviour problems (Turjanski and Lloyd, 2005).

Some drugs used in the treatment of psychiatric illness have been associated with the occurrence of parasomnias which may have unwanted effects on mood and behaviour. Reported examples are tricyclic antidepressants, lithium and zolpidem which have been linked with the occurrence of sleepwalking, and certain drug withdrawal states (imipramine, amphetamine and alcohol) have been associated with rapid eye movement sleep behaviour disorder (Cartwright, 2010).

Effects of sleep disruption and poor quality sleep caused by parasomnias

Although the duration of an individual's sleep may seem satisfactory, the quality and restorative value of his/her sleep is poor because of repeated interruptions (Bonnet and Arand, 2003). Some of the medical comorbidities mentioned earlier as being associated with parasomnias are likely to 'fragment' sleep. Poor quality sleep can be a potent cause of excessive daytime sleepiness with its adverse mood and behavioural consequences Whereas sleep loss or poor quality sleep in adults causes a reduction of activity, the opposite can occur in children, producing attention deficit hyperactivity disorder-type behaviour.

KEY POINTS

- Parasomnias (recurrent abnormal nocturnal events) are a common form of sleep disorder.
- They can cause psychological problems in various ways.
- In patients with parasomnias their precise nature needs to be determined and the origins of any mood and behaviour disturbance assessed.
- The origins of psychological changes can be assessed systematically by reference to the possible contributory factors discussed in this article.
- This should suggest an appropriate programme for the treatment and prevention of psychological complications associated with parasomnias in the individual case.

Reactions of patients to their parasomnia experiences and reactions of those witnessing the episodes

As mentioned earlier, patients who are aware of their parasomnias from being awake at the time they occur or by being told about them by witnesses may worry unnecessarily that they have a medical or psychiatric disorder. Alternatively, they may be influenced by the reactions of those who have witnessed the episodes.

Parents may well worry that arousal disorder episodes (or other types of dramatic parasomnia) indicate a serious underlying cause, and transmit their fears to their child. In adults, relatives and others might misconstrue the nature of sleep-related eating disorder, sexomnias or sleep-related acts of violence, believing that the behaviour is consciously motivated. If childhood nocturnal enuresis is viewed as wayward behaviour, children may be distressed at being punished by their parents.

Consequences of misdiagnosis and mismanagement

Sleep disorders, perhaps especially parasomnias, seem to be particularly at risk of diagnostic uncertainty or error which can lead to confusion and disappointment (Stores, 2010). Of the pre-sleep parasomnias perhaps the most serious error is to misdiagnose the complex combinations of hallucinatory experiences and sleep paralysis described earlier as psychotic illness. Arousal disorders can be confused with other dramatic parasomnias, or they may mistakenly be thought to suggest an underlying psychological or medical condition including non-convulsive seizures.

Nocturnal frontal lobe epilepsy is often misdiagnosed as nightmares, sleep terrors or 'hysteria' mainly because the complicated motor manifestations and vocalizations which characterize many attacks are very different from other seizure types (Nobili et al, 2014). Rapid eye movement sleep behaviour disorder can also be confused with other dramatic parasomnias or even motivated behaviour. The combination of arousal disorders and rapid eye movement sleep behaviour disorder ('parasomnia overlap disorder') may confuse matters further. Nocturnal panic attacks, dissociative states and other 'pseudo-parasomnias' are other parasomnias at risk of being misdiagnosed and inappropriately managed.

Conclusions

The psychological complications of the parasomnias are an important but relatively unappreciated clinical topic compared with the adverse effects of other types of sleep disorder. Most psychological disturbances (sometimes of

a dramatic nature and subject to diagnostic error) form part of the clinical manifestations of the parasomnia episodes themselves; others are the result of related factors. Systematic assessment of the various possible origins of mood and behaviour disturbance in people with parasomnias can indicate ways in which prevention and successful treatment of these psychological complications can be achieved. **BJHM**

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