Aspects of sleep disorders in children and adolescents

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Sleep disorders in children and adolescents is a topic that has been, and remains, neglected in both public health education and professional training. Although much knowledge has been accumulated in recent times, it has been poorly disseminated and, therefore, relatively little is put into practice. Only some general issues can be discussed in this article. The aspects chosen relate mainly to clinical practice, but they also have relevance for research. They concern various differences between sleep disorders in children and those in adults, the occurrence of such disorders in young people, their effects on psychological and physical development, the essential (but often ignored) distinction between sleep problems and their underlying causes (ie, sleep disorders), types of sleep disturbance encountered at different ages during development, and the differential diagnosis of certain parasomnias that are at particular risk of being confused with each other.

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Awareness of the importance of sleep disorders medicine is undoubtedly gaining ground, but the pace of progress is slow. The considerable amount of knowledge that has accumulated in recent times remains underutilized because awareness of these advances by both the general public and professionals remains inadequate. This is especially so regarding pediatric aspects of sleep and its disorders.

Health education for parents and prospective parents often pays little regard to sleep. With some commendable exceptions, medical students, and specialist trainees, including pediatricians and child psychiatrists, health visitors, child psychologists, and teachers, receive little relevant instruction despite the fact that they all come into contact with many young people whose sleep is disturbed, sometimes with serious consequences.

This relative neglect of children is interesting historically. To some degree it can be seen to reflect the very gradual and sporadic emergence of pediatrics in general as a branch of medicine in its own right. At times (and in some respects still), children have been thought of as little adults.

The extent to which this has been the case has been hotly debated by historians. On various grounds, Aries[1] argued that for many centuries childhood was not acknowledged as a distinct period of development. This view was considered by some to have lingered on in some respects until as late as the 19th century; witness child labor and

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sometimes the use of severe punishment of the type meted out to adults. Others have vigorously contested Aries' claim, pointing out the various ways in which, from early times, children have been recognized by parents and both secular and Church law, for example, as being very different from adults.[2]

Despite this counterclaim, it is interesting to trace the slow and (at least initially) faltering development of pediatrics as a specialty, the classic account of which remains Still's *The History of Paediatrics*, first published in 1931.[3] Hippocrates was probably the first eminent writer to pay special attention to children's diseases, followed, some hundreds of years later, by Soranus and Galen and then, much later again, Rhazes and Avicenna. Still describes the gathering (although sporadic) momentum in more recent centuries, often in relation to descriptions of individual pediatric conditions, but eventually leading to more systematic and comprehensive clinical accounts and provision of pediatric services in the 19th and 20th centuries.

Along the way, a particularly notable figure, for whom Still seems to have had a special regard, was Thomas Phaire, a lawyer and physician, who in 1545 published *The Boke of Chyldren*, the first pediatrics textbook written by an Englishman.[4] The book proved very popular, and ran to several editions. It deserves special mention for many reasons, not least because it discusses children's sleep problems and disorders.

Phaire described (fancifully by modern standards) the clinical features, supposed causes, and recommended treatments for various "*infirmities of children*":

> Although (as affirmeth Plinie) there are innumerable passions & diseases, where unto the bodye of man is subiecte, and as well maye chaunce in the young as in the olde: Yet for moste commonly the tender age of children is chefely vexed and greuved with these diseases folowyng.

He then lists 40 such diseases which include "*watchyng out of measure,*" (sleeplessness) "*terryble dreames and feare in the slepe*," "*colyke and rumblyng in the guttes*" (a potential cause of bedtime settling difficulties), and "*pyssyng in bedde*"!

The flavor of his account can be judged from the following example concerning '*Of Watchyng Out of Measure*' (substitute 'v' for 'u' in places):

> …it procedeth commonly by corrupcion of the mylke, or to muche abundance, whiche ouerladeth the stomake, & for lacke of good dygestion, vapours and fumes aryse into the head, and infect the braine, by reason wherof the child can not slepe, but turneth & vexeth it self wt crying. Therfore it shalbe good to prouoke it to a natural slepe thus…
>
> …the seades & the heades of popye, called chesbolles, stamped with rosewater, and myxte with womans mylke, and the whyte of an egge, beaten al together and made in a plaister causeth the chylde to receyue his natural slepe.

Knowledge of children's sleep problems has improved considerably since Phaire's time, but the attention paid to them still lags behind that regarding sleep disturbance in adults. The 2005 revision of the *International Classification of Sleep Disorders (ICSD-2)*[5] improved on previous classification schemes, but its reference to children's disorders remains somewhat gestural. Similarly, children's sleep disorders, including their distinctive characteristics, are consistently under-represented at conferences.

ICSD-2 describes nearly 100 sleep disorders, many of which occur in children and adolescents. That being so, it would be "mission impossible" to attempt even an outline account of them all in this short article. Instead, just some aspects of sleep disorders in young people have been selected, chosen because they deserve special attention, as they are somewhat understated in usual accounts. More detailed coverage of pediatric sleep medicine (including complete references) can be found elsewhere.[6,7] A further, nontechnical source for lay readers (including parents), or professionals with limited familiarity with the field, is also available.[8]

Comparison of children and adults

Discussion of the differences concerning sleep and its disorders between children and adults is appropriate because of the basic importance of the topic for both clinical practice and research. Such differences can be identified in various respects.

Changes in sleep physiology

There are profound changes in sleep physiology during childhood and adolescence for which there is no real counterpart in adult life. Rapid eye movement (REM) sleep is particularly abundant in very young children, perhaps because of its importance for early brain development. The circadian body clock takes time to develop but, from about 6 months, should allow fairly continuous night-time sleep without the need for repeated feeds at night.

Sleep requirements

These gradually lessen throughout childhood until about the time of puberty, when the need for sleep might actually increase somewhat. This, combined with a physiological delay in the sleep phase at puberty (opposite to the sleep phase advance in the elderly), as well as late-night social activities, sets the scene for potentially severe sleep deprivation and excessive daytime sleepiness (the delayed sleep phase syndrome, or DSPS) which readily leads to educational and social difficulties in adolescence.

Pattern of occurrence of sleep behaviors and disorders

This differs between children and adults. Some sleep disorders occur much more commonly in children and adolescents, notably bedtime settling and troublesome nightwaking in young children (the result of not acquiring good sleep habits and overdependence on parental attention). Adolescent DSPS has just been mentioned. Other examples include rhythmic movement disorders (such as head-banging), nocturnal enuresis, and arousal disorders seen mainly in prepubertal children.
Interestingly, some sleep disorders previously thought to occur mainly or exclusively in adults are now recognized in children, eg., obstructive sleep apnea, restless legs syndrome,[9] periodic limb movements in sleep,[10] and even REM sleep behavior disorder (RBD).[11]

Etiological factors

In explaining the cause of sleep problems at any age, both physical and psychological possibilities (perhaps in combination) have to be considered. In children, as in adults, neurological, respiratory, metabolic, endocrine, genetic, medication, or other physical factors may have an influence. That said, parenting practices play a major part in many children's sleep problems. Parental knowledge, attitudes, and emotional state often determine whether a child's sleep pattern is a problem or not. Some parents construe normal behavior as a problem; others do not seek help when they should, perhaps because they mistakenly think there is no treatment available.

Clinical manifestations and associations

Whereas obesity is a common feature of obstructive sleep apnea (OSA) in adults, enlarged tonsils and adenoids are usually responsible in children. Although obesity is increasingly an important factor at all ages, only a minority of children with OSA are overweight and, indeed, very early onset may cause low body weight from failure to thrive.
Adult OSA generally causes sleepiness and reduced activity. In contrast (as in other causes of excessive sleepiness such as narcolepsy), some sleepy children are abnormally active. This can lead to a diagnosis of attention-deficit hyperactivity disorder (ADHD) and inappropriate treatment with stimulant drugs.

Misdiagnosis

There is a risk that certain sleep disorders will be misdiagnosed at any age.[12] Possibly this risk is greater in children than adults because of the wider range of clinical manifestations and alternative explanations for the behavioral changes involved both as primary features of the sleep disorder but also because of secondary complications. Narcolepsy can be a case in point.[13] Diagnostic problems can also arise from the fact that polysomnographic (PSG) criteria for OSA and narcolepsy are ill-defined and different from those used for adult patients.

Significance

Many childhood sleep disorders can be expected to resolve spontaneously in a way that is unusual in adults. However, in the meantime (as at any age), persistent sleep disturbance can have harmful effects on mood, behavior, performance, social function, and, sometimes, physical health. This can have particularly serious consequences in young people especially, as poor management of childhood sleep problems can also lead to their persistence into adult life.
However, children's sleep disorders are generally less associated with psychiatric illness. It is important for parents to know that the strange sleep-related behavior (in, for example, head-banging or sleep terrors) is very unlikely to mean that their child has a serious psychiatric or medical disorder.

Treatment and prognosis

Treatment of most children's sleep disorders is, in principle, straightforward and likely to be effective if appropriately selected and implemented with conviction.

Unfortunately, however, many parents are unaware of frequently simple ways in which sleep problems in young children in particular can be prevented or minimized by the way they deal with their child at bedtime or during the night.

Although it is true that many adults are also unaware that their sleep problems are amenable to treatment, in a significant number of cases (say, of chronic insomnia), effective treatment is less readily achieved than in children because the origins of the sleep problem and, therefore, the management required, is more complicated.

Especially in the treatment of insomnia or sleeplessness, medication has an even smaller part to play in children than it has in adults. Instead, behavioral methods (also often important for adults) are much more appropriate and effective,[14] with the possible exception of sleeplessness in children with neurodevelopmental disorders and some other chronic pediatric conditions for whom further research on pharmacological approaches (including the use of melatonin—a contentious topic still) is required.[15]

It might be argued that the relevant specialties and disciplines on which it is necessary to draw for assessment and management of children with disturbed sleep are wider than is the case with adults. The number of traditional boundaries which have to be crossed in sleep medicine is considerable at any age, but in the case of young patients, in addition to medical specialties, for example, developmental psychology, and child and family psychiatry, often have to make their contributions. Different influences may operate at different ages as the many changes during the course of development proceed.

Occurrence of sleep problems in children and adolescents, including high-risk groups

Estimates vary but, from the early years to adolescence, at least 30% of children in general have a sleep disturbance which is considered by parents, or the children themselves, to be significant. However, the nature of the sleep problem varies considerably with age. Bedtime difficulties and problems with night waking are common up to about 3 years of age, whereas nightmares and sleepwalking, for example, feature more in older children, and many adolescents suffer from the delayed sleep phase syndrome mentioned earlier.

However common such problems are in children overall, certain groups have sleeping difficulties much more often than this.[16] Children with a learning disability, other neurodevelopmental disorders including autism, or psychiatric conditions almost invariably have their lives (and those of their parents) further complicated by disturbed sleep and its consequences. The same can be said of children with other types of chronic pediatric illness.

Children with these various conditions do not have a new set of sleep disorders compared with other children; it is the pattern of occurrence of their sleep disorders that is different. Physical factors may loom large in the etiology of the sleep problem in many of these conditions (eg. OSA in Down syndrome) but behavioral factors (failure to develop satisfactory sleep habits) are very common overall.

Similarly, these groups of children can generally be expected to respond to the same types of treatment as other children, providing the treatment programs are correct for the sleep disorder in question. One obstacle to this is the mistaken view that, for example, serious sleep problems are inevitable in neurodevelopmentally disordered children, and that the problems have to be endured because treatment will not work. This is not the case, even when the sleep problem has already lasted some time but, sadly, for lack of information to the contrary, many such children go untreated.

Developmental effects of persistently not sleeping well

The potentially serious and widespread effects of persistently disturbed sleep (especially inadequate or poor quality sleep) deserve to be more widely known by parents and professionals alike. This alone would increase the use of the various types of treatments that are available.

Emotional state and behavior

"Overtired" children often become very difficult to handle; they become irritable, distressed, and even aggressive, much to the exasperation of their parents. In some children, such problems are frequent and seriously disrupt family life. Reference has been made to the fact that certain young children said to have ADHD characterized by overactivity, impulsiveness, and poor concentration, are reported to have a primary sleep disorder. Stimulant drugs are not appropriate in this subgroup and might make matters worse by increasing the sleeping difficulty.

Especially in adolescence, persistent loss of sleep can have a depressing effect and lead to the problems at home and at school to which reference has also been made.
Disturbed sleep can affect a child's emotional state and behavior in various other ways. Bedtime can become a source of distress if associated with frightening thoughts or experiences that are associated with various sleep disorders, including night-time fears.

Intellectual function and education

There is convincing evidence that insufficient sleep can cause impaired concentration, memory, decision-making, and general ability to learn. Performance on tasks calling for sustained attention is particularly affected, and also those requiring abstract thinking or creativity. Similarly, motor skills and reaction time can be impaired. Studies in the USA have suggested that 80% of adolescents obtain less than adequate sleep (ie, 9 hours), 25% less than 6 hours, and over 25% fall asleep in class. Students with insufficient sleep generally achieve lower school grades.[17] Findings in other countries might well be similar.

Physical effects

As the production of growth hormone is closely linked to deep NREM sleep, if sleep is seriously disrupted from an early age, physical growth may be affected. As mentioned earlier, OSA can disrupt sleep from about the age of 2, causing the child to "fail to thrive" and be smaller for his or her age than ideal.
In addition to this effect of OSA on growth, persistent sleep loss in particular is being increasingly associated in adults with physical ill-health such as impaired immunity, obesity, hypertension, and diabetes.[18] There is no particular reason to expect that children are free of at least some of these risks.

Family and other social effects

There have been reports that relationships between parent and a child with a serious and persistent sleep problem can be severely tested to the point of increased use of physical punishment in extreme cases.[19] Parents may disagree with each other about ways of dealing with the child's refusal to go to sleep at the required time, or his or her insistence on joining them in their own bed after waking during the night. In these circumstances, marital relationships may become seriously strained.
Because of the changes of behavior that can result from sleep disturbance, the affected child's interpersonal problems may extend beyond his family. Irritable, difficult, or otherwise disturbed behavior is likely to affect friendships. Relationships with teachers can also easily suffer, especially if they are unaware that behavioral problems can be the result of inadequate or otherwise disturbed sleep.
In view of these various potential complications to the child's life, it is essential that all concerned realize they can be at least partly the result of sleep disturbance for which effective treatment can be provided in most instances.

The distinction between sleep problems and their underlying causes (sleep disorders)

It is essential to distinguish between a sleep problem and a sleep disorder, although, in practice, this is often not done.
At any age, there are just three basic sleep *problems* (or complaints)
- Not sleeping well ("insomnia" or "sleeplessness")
- Being excessively sleepy ("hypersomnia")
- Behaving in unusual ways or having strange experiences in relation to sleep ("parasomnias").

These sleep problems are not diagnoses or conditions in their own right, no more than are "breathlessness" or "pain." In order for the correct advice or treatment to be decided, it is necessary to identify the underlying cause, ie, the sleep *disorder*.
As mentioned earlier, nearly 100 sleep disorders are now officially recognized, many relevant to children and adolescents. Choice of advice and treatment rests essentially on the patient's sleep disorder. In a way that would be unacceptable in many other areas of medical practice, where the need to know the underlying cause of someone's symptoms is considered axiomatic, sleeping difficulty is often treated (quite possibly doing more harm than good) by means of medication without the cause of the problem being considered.
The treatment of sleepless young children is an example of the point just made. Many of those who do not settle to sleep at bedtime or who wake during the night demanding their parents' attention are prescribed hypnotic-sedative drugs, such as antihistamines, despite the

evidence that they are usually ineffective and subject to other drawbacks.[15] Despite its advocates' claims, especially for children with a developmental disorder, something similar can be said about the use of melatonin.[20]
As the cause of the sleeping difficulty is often failure to have acquired good sleep habits, behavioral methods are much more appropriate for encouraging such habits or undoing bad habits.[15,21] Unfortunately, parents are rarely taught ways of preventing or dealing with their children's sleep problems, with the result that many suffer needless sleep loss and distress because the child does not sleep well.

Changes in the pattern of sleep problems and disorders during development

Parents and professionals need to be familiar with the kinds of sleep disturbance that their child might develop at different ages, and know that they are collectively common and that they can be prevented or helped, for the most part. Only the main forms of sleep disturbance are mentioned here.

Infancy

It is important to encourage good sleep habits from an early stage to avoid bad sleep habits later on. The following practices are recommended to help parents to achieve this in infants:
- Establishing a consistent 24-hour routine, including a bedtime routine that provides the baby with cues that is time to go to sleep
- Not prolonging night-time feeding beyond the age (about 6 months) when the baby's body clock has developed enough to allow feeding to be confined to daytime
- Teaching the baby to fall asleep alone so that when he or she wakes in the night (a natural occurrence at all ages) he or she is able to fall asleep again without requiring his or her parents' attention ("self-soothing")
- Establishing a clear difference between day and night to help to develop the infant's body clock which controls sleep and wakefulness
- Ensuring the environment is conducive to sleep.

Safety measures to reduce the risk of the infant coming to harm at night from suffocation or other breathing problems sometimes associated with sudden infant death syndrome (SIDS), should also be part of parental education about sleep. Main recommendations[22] include the following:
- Have the baby sleep on his or her back and on a firm mattress that will not obstruct breathing
- Use a safety-approved cot with narrow gaps between the rails
- Ensure that the baby's face cannot be covered during the night
- Do not allow the baby to become overheated at night
- Be sure the bedroom is smoke-free
- Do not sleep with the baby on a sofa or armchair
- Avoid cosleeping if either parent has consumed alcohol, or has taken medication or other substances with a sedative affect.

Preschool children

The nature of the usual sleep disturbance, and the advice required, is different after infancy into the toddler period and beyond. Many children at this stage of development recurrently resist going to bed at the required time, and/or wake repeatedly at night, demanding their parents' attention, including coming into their bed. As at other ages and with other sleep problems, medical factors must be excluded but the usual explanations are behavioral, especially:
- Anxiety about separating from parents at night
- Stimulating activities within the bedroom
- Inadequate limit-setting on uncooperative bedtime or night-time behavior
- Unhelpful associations with being in bed. If parents lose their temper, or threaten or punish the child, he or she will come to associate bedtime with upset and fear
- Having failed to acquire self-soothing ways of coping with night waking.

Behavioral treatment methods can be very effective in these circumstances (sometimes in a surprisingly short time).
Other possible contributory factors with which parents need to be acquainted include:
- Inappropriate patterns of daytime napping, ie, too little or too much daytime napping for the child's age or, alternatively, a nap too near bedtime
- Putting the child to bed too early while he or she is in the "forbidden zone" of maximal alertness and not yet physiologically capable of sleep. Bedtime should coincide with being "sleepy tired"

- Night-time fears, which often begin at an early age, can cause difficulty getting off to sleep or disturbance during the night.

School-age children

Again, the pattern of sleep disorders changes somewhat at this age. Certain causes of sleeplessness in preschool children may still apply, but other causes of sleeping badly may begin to show themselves.

- Night-time fears[23] might intensify and become more complex. Such fears are usually transient and require only reassurance and comfort until they cease. Occasionally, however, they are so intense and persistent that they need special attention. In such instances the content of the fear or accompanying nightmares might be revealing. Once more, behavioral treatment is reported to be very effective.

Needless to say, the child's reluctance to go to bed because he or she is genuinely afraid must be distinguished from pretending to be afraid as a delaying tactic.

- Worry and anxiety about daytime matters may cause difficulty in getting to sleep or staying asleep. However, the original source of concern may no longer exist but the difficulty falling asleep may persist because the child has developed the habit of lying awake in bed in an agitated state ("conditioned insomnia").
- Restless legs syndrome, which (as mentioned before) is now described in children, consists of disagreeable leg sensations with an irresistible urge to move the legs causing difficulty getting to sleep. It is often accompanied by periodic limb movements. "Growing pains," said to be a cause of sleep difficulties in otherwise healthy children, is an ill-defined condition. Where they occur around bedtime, the restless legs syndrome is a possibility.[9]
- In older children and later, early-morning wakening may be part of an anxiety or depressive disorder. Otherwise, the child may have been woken too early by noise or other environmental factors which intrude into his or her sleep.

Adolescence

The generally very efficient sleep of prepubertal children changes to less satisfactory sleep in adolescence for both physiological and psychosocial reasons.

Worries, anxiety, and depression are commonly quoted reasons for not being able to sleep at this age. Nicotine, alcohol, and caffeine-containing drinks, as well as illicit drug use, are additional possible influences.

However, inability to get off to sleep and to wake up in the morning is often part of DSPS, to which reference was made earlier. This condition, which is reported to be particularly common in adolescence, is potentially very disruptive educationally and socially. As such, it deserves further discussion. DSPS is commonly misconstrued as something other than a sleep disorder.

The problem usually arises from the sleep phase delay at puberty and habitually staying up late for social or other reasons, especially at weekends or during holidays. The result is that it becomes impossible to go to sleep earlier by choice.

The features of DSPS are persistently severe difficulty getting to sleep (possibly until well into the night), uninterrupted sound sleep for just a few hours, but then great difficulty getting up for school, college, or work because of not having nearly enough sleep. This causes sleepiness and underfunctioning, especially during the first part of the day. The abnormal sleep pattern is maintained by sleeping in very late when able to do so at weekends and during holidays.

"Chronotherapy" includes gradually changing the sleep phase to an appropriate time. Where the phase delay is about 3 hours or less, bedtime can be gradually brought forward. More severe forms of the disorder require progressive sleep phase delay in 3-hour steps round the clock until a satisfactory timing is achieved which then has to be fixed.

Additional measures to maintain the improved sleep schedule include early-morning exposure to bright light and firm agreement with the adolescent to maintain a new pattern of social activities and sleep. Melatonin in the evening might also help.

Difficulties achieving and maintaining an improved sleep–wake schedule by these means are compounded if there is a vested interest in maintaining the abnormal sleep pattern, for example, to avoid school ("motivated sleep phase delay"). Psychological problems, including depression, may well also make successful treatment less likely.

The teenager's reluctance to go to bed earlier and to get up at the required time is often misinterpreted as "typical difficult adolescent behavior" causing trouble in the family. Otherwise the condition might be mistakenly viewed as the usual form of school nonattendance, primary depression, or substance misuse.

Differential diagnosis of childhood parasomnias

Parasomnias are repetitive unusual behaviors or strange experiences that occur just before, during, or arising out of sleep, or on waking. The many parasomnias (some primary sleep disorders, others secondary to medical or psychiatric conditions) now officially recognized (over 30 in *ICSD-2*) indicate how commonly and in many ways (some subtle, others dramatic) sleep can be disturbed by episodic events.

Confusion between the different parasomnias seems to be common. For example, in pediatric textbook accounts, sleep terrors and nightmares (two very different types of parasomnia) are mistaken for each other. Indeed, sometimes there is a tendency to call any dramatic parasomnia a nightmare. Correct diagnosis is important because different parasomnias each have their own significance and call for contrasting types of advice and treatment.

The following brief account is concerned with the main features to be recognized in reaching the correct diagnosis. Emphasis is placed on just some of the more dramatic parasomnias (namely arousal disorders, nightmares, and sleep-related epileptic seizures) as these often cause most confusion and concern. Detailed accounts of these parasomnias and others are provided elsewhere.[24]

Often an accurate diagnosis can be made by means of a detailed account of the subjective and objective sequence of events from the onset of the episode to its resolution, and of the circumstances in which the episode occurred, including its duration and timing. Audiovisual recording (including by means of home recording by parents) can be very informative and often adds details that are missed in descriptions given in the clinic.

For the most part (seizure disorders generally being a main exception), physiological recordings are required only when clinical evaluation is inconclusive or where the child might have more than one type of parasomnia.

Table I compares the main diagnostic features of the three chosen types of parasomnia. The meaning of the three categories is as follows.

The term "arousal disorders" refers to childhood confusional arousals, sleepwalking (calm and agitated forms of which are described) and sleep terrors. Used properly, nightmare is a straightforward term. As sleep-related epilepsy covers a number of seizure disorders of differ-

	Arousal disorders	Nightmares	Sleep-related seizures *
Age of onset (y)	1-8	3-6	Any age
Gender	Both	Both	Both
Family history	Common	Sometimes	Variable
Prevalence	Common	Common	Much less common
Usual stage of sleep	Deep NREM	REM	Variable
Time of the night	Usually first third of the night	Middle to last third of the night	Variable
Episodes at night	Usually one	Usually one	One to many
Episodes/month	Usually sporadic	Usually sporadic	Sporadic to many
Behavior	Variable but usually dramatic with intense autonomic arousal (apart from calm sleepwalking); often inaccessible and cannot be comforted; may resist intervention	Little movement during dreams but distressed on awakening, accessible and welcomes comforting; autonomic arousal usually marked	Variable, may be undirected violence or distress during or after attack in state of impaired consciousness; autonomic arousal can be considerable
Level of consciousness	Unaware during episode, confused if awakened or following episode	Asleep during episode, fully awake afterwards	Variable, may be impaired during or after attack
Memory for events	None or fragmentary	Vivid recall	Variable
Stereotyped	Somewhat	Somewhat	Often
Likelihood of injury	Moderate to high in agitated sleepwalking and sleep terrors	Low	Overall low to moderate
Prognosis	Good	Good	Good to poor

Table I. Comparison of the main features of arousal disorders, nightmares, and sleep-related seizures. REM, rapid eye movement *In view of the wide range of types of epileptic seizures associated with sleep, the descriptions given are no more than generalizations, with certain clear exceptions to the general rule (see text).

ent types, permissible generalizations are limited.

The following types of epilepsy are, to varying degrees, related to sleep. The first four types have been classified as benign in the sense that, despite their focal origin in the brain, they are not typically the result of a structural abnormality and can be generally expected to remit spontaneously in time.[25] All five types can readily be confused with nonepileptic parasomnias as their clinical features can be complex and dramatic.

- *Benign partial epilepsy with centro-temporal spikes (Rolandic epilepsy)* is a common form of childhood epilepsy in which about 75% of patients have their seizures exclusively during sleep. The seizures involve distressing oropharyngeal-facial movements and sensations corresponding to the anatomical origin of the seizures. Actually, some doubt has been raised recently about their entirely benign nature.[26]
- Apparent terror and screaming occur in *benign epilepsy with affective symptoms*.[27]
- The child's reactions to the complex visual experiences (including hallucinations) that can occur in *benign occipital epilepsy* can involve dramatic behavior.
- In the *Panayiotopoulos syndrome* seizures often involve distressing vomiting and other autonomic symptoms.
- *Nocturnal frontal lobe epilepsy* (NFLE) deserves special mention because its clinical manifestations make it particularly prone to misinterpretation as nonepileptic phenomena. Although mainly described in adults, it also occurs in children.[28] It is now known that NFLE can take a variety of forms,[29] but a usual variety is often misdiagnosed mainly because the complicated motor manifestations (eg kicking, hitting, rocking, thrashing, and cycling or scissor movements of the legs) and vocalizations (from grunting, coughing, muttering or moaning to shouting, screaming, or roaring) which characterize many attacks. As such, they are very different from other seizure types. The abrupt onset and termination, short duration of the attacks (different from seizures of temporal lobe origin) and, sometimes, preservation of consciousness can also suggest a nonepileptic (even attention-seeking) basis for the attacks.

  In the first instance, diagnosis rests on awareness of this form of epilepsy and recognition of its clinical features. EEG recordings, even during the episodes, are of limited diagnostic value.

  The distinction between epilepsy and other parasomnias can be difficult. Recently, the Bologna group of clinical researchers have attempted to set out clearly the (mainly clinical) criteria for distinguishing between NFLE and other parasomnias.[30]

Conclusion

Hopefully, this brief and highly selective account will have conveyed some of the special considerations and points of emphasis that are relevant to sleep disorders in children and adolescents. As much is already known but little is practised, it is to be hoped that awareness will increase about such developmental aspects which are important for both clinical work and research in the field of sleep disturbance in young people. ❑

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Algunos aspectos de los trastornos del sueño en niños y adolescentes

Los trastornos del sueño en niños y adolescentes constituyen un tópico que ha sido y continúa abandonado tanto en la educación de salud pública como en el entrenamiento profesional. Aunque se ha acumulado bastante conocimiento en el último tiempo, éste ha sido escasamente difundido y por lo tanto es relativamente poco lo que se ha traspasado a la práctica. En este artículo sólo es posible discutir algunos temas generales. Los aspectos elegidos se relacionan principalmente con la práctica clínica, pero ellos también tienen importancia para la investigación. Estos se refieren a diversas diferencias en los trastornos del sueño entre niños y adultos, a la ocurrencia de tales trastornos en gente joven, a sus repercusiones en el desarrollo psicológico y físico, a la distinción esencial (pero a menudo ignorada) entre problemas del sueño y sus causas subyacentes (por ej. trastornos del sueño), a los tipos de alteraciones del sueño encontrados en diferentes edades durante el desarrollo, y al diagnóstico diferencial de ciertas parasomnias que fácilmente pueden confundirse entre ellas.

Aspects des troubles du sommeil chez l'enfant et l'adolescent

Les troubles du sommeil chez l'enfant et l'adolescent ont été et restent un sujet négligé à la fois par la politique éducative de la santé publique et par la formation professionnelle. Malgré l'accumulation récentes de nombreuses connaissances, ces dernières ont été peu divulguées et donc faiblement mises en pratique. Cet article n'envisage que quelques points de vue généraux, principalement liés à la pratique clinique, mais qui peuvent être intéressants pour la recherche. Ils concernent plusieurs différences entre les troubles du sommeil de l'enfant et ceux de l'adulte, leur apparition chez le jeune, leurs effets sur le développement psychologique et physique, la distinction essentielle (mais souvent ignorée) entre les perturbations du sommeil et leurs causes sous-jacentes (par exemple, les « troubles » du sommeil). L'article traite également des types de perturbation du sommeil selon les différents âges pendant le développement et du diagnostic différentiel de certaines parasomnies qui peuvent être confondues entre elles.

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