

THE ROLE OF SLEEP IN MIGRAINE ATTACKS

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SUMMARY — Migraine attacks may be precipitated by sleep deprivation or excessive sleep and sleep is also associated with relief of migraine attacks. In view of this variable relationship we studied the records of 159 consecutive outpatients of our Headache Unit. In 121 records there was reference to sleep involvement, in 55% by a single form and in 45% by more than one form. When only one form was related, relief was most common (70%). 30% of that group of patients had the migraine attack precipitated by sleep, 24% by deprivation and 6% by sleep excess. When the effects of sleep were multiple, these effects were as expected logically in 65%: «in accordance» group (e.g attack precipitated by sleep deprivation and relieved by sleep onset. In a second group, («conflicting») where the involvement was not logical, there were three different combinations of sleep involvement, possibly due to more than one pathophysiological mechanism.

KEY WORDS: migraine, sleep, precipitating factor, sleep deprivation, sleep excess, relieving factor, worsening factor.

Papel do sono em crises de enxaqueca.

RESUMO — Crises de enxaqueca podem ser precipitadas por privação ou excesso de sono e o sono também se encontra associado ao alívio de crises de enxaqueca. Dada essa variabilidade de relação, estudamos os registros de 159 pacientes de ambulatório vistos consecutivamente no SITC. Em 121 havia referência a relação com o sono, em 55% de uma só maneira e em 45%, de mais de uma. Quando apenas um modo foi relatado, o alívio foi mais frequente (70%). 30% desse grupo de pacientes apresentavam crise de enxaqueca precipitada pelo sono, 24% por privação e 6% por excesso de sono. Quando eram múltiplos os efeitos do sono, eram eles os logicamente esperados em 65%: grupo «de acordo» (exemplo: crise precipitada por privação de sono e aliviada no início do sono). Em um segundo grupo («conflitante») a relação não era lógica, três tipos diversos de combinação do relacionamento tendo sido encontrados, possivelmente devido à participação de mais de um mecanismo fisiopatológico.

PALAVRAS-CHAVE: enxaqueca, sono, fator precipitante, privação de sono, excesso de sono, fator de alívio, fator de piora.

The relationship between migraine and sleep has long been recognized^{2,7-9,13,14,17,18}. Migraine attacks may be precipitated by sleep deprivation or excessive sleep^{4,7-9,13}, and sleep is also associated with relief of migraine attacks^{2,3,13,20}. In view of this variability, we decided to study the various types of relationship between migraine and sleep in a group of migraine sufferers.

PATIENTS AND METHODS

The standard records of 159 consecutive outpatients of the SITC, from January 1989 to April 1990 were studied. In addition to demographic data, the following features of pain

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were considered: site, duration, intensity, precipitating, preceding, relieving, and exacerbating factors. The diagnosis was based on the IHS Classification 6. The patients ages ranged from 9 to 67 (mean 35.5) years, 131 were female and 28 male. The diagnosis was migraine without aura in 100, migraine with aura in 50, and 9 with both forms.

The patients were grouped according to the role of sleep.

Group 1. Patients where sleep participated of a single form whether as a precipitating, relieving or exacerbating factor.

Group 2. Patients where sleep participated with more than one form. Sub-group 2A was formed by those patients in whom sleep deprivation precipitates a migraine attack and sleep relieves it, and those where excess of sleep precipitates a migraine attack and sleep worsens it. Sub-group 2B was formed by those patients in whom sleep deprivation and excess of sleep precipitate migraine attacks, those in whom sleep both precipitates and relieves migraine attacks, those in whom sleep deprivation and sleep excess precipitate migraine attacks and sleep relieves it, and those where sleep deprivation precipitates a migraine attack and sleep worsens it.

RESULTS

The main results are shown in Tables 1 to 3.

Sleep was related to migraine in a single form 67 patients (55%), two forms in 46 (38%) and three forms in 8 (7%) of the patients.

COMMENTS

As can be seen from our results, sleep had some relation to migraine attacks in 76% of our patients, whether as a precipitating, relieving or exacerbating factor. In over half of our patients (55%), the relationship was with a single form of sleep and in 70% sleep relieved the migraine attack. When it participated in a single form, relief was the most common form of participation. These results are in accordance with other authors^{2,15,20}.

Table 1. Sleep participation during migraine attacks with regard to sex.

Sex	Sleep Participation		Total	% Yes
	Yes	No		
Male	25	3	28	89
Female	96	35	131	73
Total	121	38	159	76

Table 2. Sleep participation as an unique form.

Factors	Patients	
	N	%
Precipitating	20	30
deprivation	16	24
excess	4	6
Relieving	47	70
Total	67	100

Table 3. Patients in whom sleep participates in more than one form in migraine attacks.

Data	Patients	
	N	%
«in accordance»	35	65
precipitated by sleep deprivation and relieved by sleep		
«conflicting»	19	35
precipitated by sleep deprivation and sleep excess	3	5
precipitated by sleep excess and relieved by sleep	8	15
precipitated by sleep deprivation and sleep excess and relieved by sleep	8	15
Total	54	100

We observed also that when sleep acts as a precipitating factor, it was usually sleep deprivation that stimulated the attack. The information regarding precipitating and relieving factors was obtained by spontaneous reference by the patient. When the patient did not volunteer all of this information, the physician would mention other possible factors which might be related to migraine attacks. It is important to consider this methodology, since in a previous report, where we only considered the information spontaneously volunteered by the patient, we observed that sleep acted as a precipitating factor in 3% of patients¹⁶.

In some situations, particularly when sleep participates in more than one form, it is possible that different pathophysiological mechanisms could be involved. For example when sleep excess precipitates an attack and onset of sleep aborts or relieves it. On the other hand, when sleep deprivation precipitates and sleep onset relieves the migraine attacks, it is likely that only one mechanism is activated. It is based on these hypotheses that we divided the patients into two groups «in accordance» and «conflicting». In the «in accordance» group there were no instances of sleep excess precipitating an attack which was worsened by sleep onset. In the «conflicting» group, there were no cases of sleep deprivation precipitating an attack which was worsened by sleep onset nor were there any patients in which both sleep deprivation and excess precipitated attacks and sleep onset relieved and worsened attacks.

It is known that the migraine attacks may occur during the nocturnal sleep period or following a short period of diurnal sleep, but only after periods of stage III and IV or REM sleep⁸. During the course of nocturnal sleep, the periods of REM sleep gradually increase in length especially if sleep is extended into the morning¹¹. In some patients sleep deprivation precipitated a migraine attack. This may be due to a decrease in the pain threshold, probably as a result of alterations in neurotransmitter systems¹⁹. On the following night, there is a predominance of slow wave sleep, and this readjustment may be the way that sleep relieves the migraine attack^{1,5}.

The cyclic nature of migraine may have relationship with some chronobiological phenomena¹⁴. Some authors imply a vulnerability of the central nervous system. There may also be dysfunction of the endocrine system and neurotransmitter processes connected with pain production¹². Another group of authors emphasize the chronobiological relationship between headaches and behavioral disturbance (for example: the pre-menstrual tension syndrome), postulating that supposedly different disorders can be brought about by dysfunction of the central «clock» and the chain of related psychoneuroendocrinological events¹⁰.

Additional studies are required to understand the features of the relationship between sleep and migraine.

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