

## Migraine Headaches and Sleep Disorders in Children

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The connection between headaches and sleep disorders has recently come under greater scrutiny as more and more studies are being conducted to elucidate this relationship. Questionnaire studies have shown a significant increase in the sleep disturbances amongst patients with headaches compared to healthy controls [1-4]. This “disturbed sleep” includes insomnias such as difficulty falling and remaining asleep, parasomnias such as restless leg syndrome, sleep paralysis, hypnagogic startles, and bruxism, and disordered breathing such as snoring and trouble breathing [1]. Morning, or “awakening” headache patterns can be signs of a sleep disorder. Snoring and sleep apnea can exacerbate migraine headaches [5]. This relationship has been demonstrated in adults and more recently it has been reported in studies focusing on children [2-4,6]. For example, Heng and Wirrell [2] compared children with migraines to their siblings without migraine and found that the migraine sufferers had a higher occurrence of sleep disorders when compared to their healthy control siblings [2]. Not only did the children with headaches have a higher rate of sleep disorders, but they found that the patients with greater migraine severity had significantly increased sleep disturbances [2].

Multiple studies have compared patients with migraines who were and were not on medications and have found differing results. In one study by Luc et al., no significant difference between children with migraine using and not using medications for any reasons (headaches or non-headaches treatment) was found, providing evidence that medication was not a confounding factor when analyzing data [6]. However, a different study conducted by Heng et al. found a significantly higher prevalence of sleep disorders in children with migraines who use daily prophylactic medications compared with those migraine sufferers who do not [2]. Yet, the results of Heng’s study may not necessarily contradict those of Luc et al. [6], since Heng’s study also provides evidence that the severity of the migraine was related to the severity of the sleep disturbances so the patients who received the medications likely suffered from more severe migraines, causing them to be predisposed to more severe sleep disturbances.

In relation to the origins of migraines and sleep disturbances no definitive conclusions have yet been made; serotonin levels affect both REM sleep and migraines so a common origin of this neurological and sleep disorder relationship may involve the brain’s balance of serotonin. Pakalnis et al. [7] reported no correlation of whole blood serotonin level to migraines with sleep disorders. Further studies would need to be done comparing serotonin levels among patients with migraines and sleep disorders to evaluate the validity of this hypothesized common intrinsic origin. A hypothesis by Carotenuto et al. [8] suggests “cortical system arousal dysfunction” as a common origin of enuresis (a sleep disorder) and migraines (a neurological disorder); however, no studies have yet been conducted to provide more substantial evidence towards this hypothesis. Sabayan et al. [9] proposed a “joint origin” of restless leg syndrome (sleep disorder) and migraine (neurological disorder); such an association of restless leg syndrome with migraines were reported by other investigators [10,11]. Further studies are necessary to confirm and extend such an association.

Heng et al. point out in their study the complex nature of the sleep/neurological disorder relationship since sleep deprivation caused by

sleep disturbances can cause headaches and behavior problems, which in turn lead to stress, which can further exacerbate the headaches and disordered sleep [2]. The most effective treatment would be one that can treat both problems simultaneously since one problem can cause the other if left unchecked. Clinicians who treat headaches should be aware of the complex interaction between headaches and sleep disorders in children.

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