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Psychiatry

CASE CONTROL STUDY OF SLEEP DISTURBANCES IN CHILDREN WITH ATTENTIONDEFICIT HYPERACTIVITY DISORDER

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KEYWORDS :

INTRODUCTION

Sleep is necessary for emotional processing, memory consolidation, physiological repair, and brain information processing. regulation. And they all significantly affect children's metabolism, immune system, emotional control, attention, behaviour, and cognitive development (1). The prevalence of sleep disorders in kids is about 25%, with 25 to 50% of preschoolers and 40% of teenagers reporting some sort of sleep issue (2, 3).

One of the most prevalent problems at this time of life is attention-deficit hyperactivity disorder (ADHD), a neurodevelopmental illness of childhood. It is a very diverse clinical illness that is characterised by the three nuclear symptoms of inattention, impulsivity, and hyperactivity together with learning difficulties. It is brought on by a confluence of biological, social, and psychological variables (4).Moreover, about 30% of kids with ADHD have varying degrees or forms of the illness (5). Sleep difficulties and behavioural issues problems (6), including agitation, emotional instability, and a poor threshold for frustration, all of which raise the risk of ADHD (7). Even though there are numerous contributing factors to ADHD's aetiology, more and more studies point to a mutually causative shared underlying neurological aetiology between ADHD and sleep disturbances (8).In order to better treat the core symptoms and sleep disorders of children with ADHD through early, comprehensive intervention, to encourage the restoration of cognitive and social function in children, and to improve their quality of life, our goal was to look into the relationship between ADHD and sleep disorders in children.

METHODOLOGY

Data was collected from parents of 30 ADHD cases and 30 controls after Institutional Ethical Committee (IEC) permission and the necessary consents/assents. ICD-11 criteria were used to diagnose ADHD (International Classification of Diseases 11th Revision). In 30 cases and 30 controls, the Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS) was used to gauge the severity of ADHD, while the Children's Sleep Habits Questionnaire was utilised to gauge sleep issues as reported by parents.

RESULTS AND OBSERVATIONS

Table 1: Demographic and Clinical characteristics of children

	ADHS (n=30)	Control (n=30)	P value
Age	8.73	8.58	0.46
Gender (M/F)	22/8	16/14	0.76
SES	50.24	52.3	0.64
WISC Full scale	97.58	107.16	0.15
PPS	6.42	6.78	0.59
BMI	16.8	18.1	0.26
CBCLT score	62.43	49.78	0.001**
CGIT – Teacher score	63.27	47.16	<0.0001***
CGI – Parent's T score	64.78	52.36	<0.0001***
Diagnostic of PLMD	2	2	0.68

Table 2: Sleep measurements

Sleep measurements	ADHS (n=30)	Control (n=30)
Sleep latency (min)	28.78±19.95	31.83±23.48
Total sleep time (min)	495±71.68	538±48.15
Sleep Efficiency	92±4	96±6
PLMS Index	2.75±3.52	3.91±4.18
Arousal Index	0.48±0.53	0.73±0.65

Table 3: Factors for reported sleep problems

Factors for reported sleep problems	ADHS (n=30)	Control (n=30)
Bedtime resistance	8.78±2.95	6.8±1.65
Sleep onset delay	1.6±0.7	1.49±0.59
Sleep anxiety	5.9±2.1	4.31±1.78
Night wakings	5.3±1.93	3.91±1.47
Parasomnias	9.3±1.91	8.32±2.1
Sleep disordered breathing	3.1±1.08	2.68±0.65
Daytime sleepiness	13.23±3.78	11.21±3.25

DISCUSSION

REM sleep was observed to be less frequent in children with ADHD than in control groups. These results are consistent with recent research showing impaired REM sleep in children with ADHD. (9-13) These results might indicate that ADHD Children frequently have sleep issues, which may be linked to the pathophysiology of the condition. The dorsal hippocampus's levels of brain-derived neurotrophic factor (BDNF) have been found to rise during REM sleep. (14,15)

The pathophysiology of ADHD has been linked to BDNF, and two family-based association studies have shown a link between BDNF polymorphisms and the disorder.47-49 Moreover, the catecholamine systems have been linked to the pathophysiology of ADHD and the control of arousal and sleep (16,17).

For instance, a number of anatomical, animal, and clinical studies have suggested that dopamine signalling has a role in mechanisms that directly relate to REM sleep as well as in the control of general sleep(16,17). Thus, The mechanisms underlying the pathophysiology of ADHD and the control of REM sleep appear to be connected.

The Inadequate Sleep Factor, which included daytime tiredness and sleep onset issues, was found to be more loaded in children with ADHD. It's interesting how bedtime resistance loaded on a different component. This may imply that, as contrast to behavioural sleep onset issues, the sleep onset issues that weighted on this component represent a physiological difficulty to fall asleep.(18-20)

The fact that children with ADHD scored higher on this factor and the loading of the daytime sleepiness subscale, which includes statements like "Takes long to be alert," "Seems tired," and "Having hard time getting out of bed," are also consistent with studies using the multiple sleep latency test, which showed that children with ADHD exhibited significantly more daytime sleepiness than controls. (21,22) These signs and symptoms are similar to the clinical picture of circadian phase delay, which is characterised by persistent difficulty falling asleep on time and increased daytime sleepiness. Hence, we speculate that the circadian system may occasionally have a role in the sleep issues that are typical of children with ADHD.

There may be other causes for the connection between ADHD and sleep. First, we looked at common genetic variants for sleep features in our study, but it's also plausible that rare or de novo genetic variants for

sleep traits or ADHD can potentially cause sleep disorders that co-occur with ADHD.

The second is the significance of gene-environment interactions; children with ADHD who have a genetic predisposition to sleep issues and are exposed to specific environmental risk factors may experience sleep disruptions. The PGS were based on looking at a small portion of the genome (tens of thousands of SNPs), and our sample is substantially smaller than those normally used in GWAS and genome-wide genetic association analyses. This brings us to the third factor, power.

CONCLUSION

Children with ADHD frequently experience sleep issues, which have an effect on how well they feel overall, as well as on their family dynamics. Knowing the causes of these sleep issues is crucial to comprehending the aetiology of ADHD and identifying people who might be more susceptible to developing these issues. Sleep disturbances are commonly occurring problems in children with ADHD. Although not much clinical attention is given to it, it requires further large-scale studies to understand various factors influencing sleep pattern in children with ADHD.

Little evidence suggests that polygenic liability for lengthy sleep duration may be over-transmitted from parents to children using two large samples of children with ADHD. There is some evidence that polygenic liability for short sleep duration may be over-transmitted from parents to children.

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