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A study to assess the frequency of sleep disturbances in down syndrome children.

[1]Vivechana Kaniyala, Junior Resident, Department of Pediatrics, Bangalore Medical College and Research Institute, Bangalore.

[2]Anil Kumar H, Assistant Professor, Department of Pediatrics, Bangalore Medical College and Research Institute, Bangalore.

[3]Mallesh Kariyappa, Professor and HOD, Department of Pediatrics, Bangalore Medical College and Research Institute, Bangalore.

Corresponding Author: Vivechana Kaniyala, Junior Resident, Department of Pediatrics, Bangalore Medical College and Research Institute, Bangalore.

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Abstract

Introduction: Down syndrome or trisomy 21 is the com monest chromosomal abnormality. Sleep problems are very common in these children. According to National Institute of Health 76% of children with Down syndrome experience sleep disturbances. (1,2) This study is con ducted to know the frequency of sleep disturbances in children with Down syndrome at our center.

Method: A cross sectional study was conducted, data was collected regarding sleep habits of 43 Down syn drome children attending District Early Intervention Centre (DEIC) at Vani Vilas Childrens Hospital, Banga lore. Sleep disturbances in these children will be as sessed using Sleep Disturbances Scale for Children (SDSC). Assessment tool were evaluated, variables assessed using chi-square test.

Results: There is significant sleep disturbance in child ren with Down syndrome. 30.8% preschool children and 17.6% of children above 6 years of age were found to have significant sleep problems. Disorders of initiation of sleep and Excessive somnolence were the most com mon sleep disorders in our study.

Conclusion: Parents report a significant sleep distur bance in both preschool and school aged children with Down syndrome. Pediatricians should routinely enquire about sleep habits in such children.

Keywords: Down syndrome, Sleep, Sleep Disturbances Scale for Children

Introduction

Down syndrome or trisomy 21 is the commonest chromo somal abnormality occurring in humans. They present with wide range of clinical signs and symptoms like

developmental and intellectual disabilities, neurological features, cardiac defects etc. (1)

Sleep problems are commonly seen in children with Down syndrome. According to National Institute of Health (2) 76% of children with Down syndrome experi ence difficulty with sleep onset and ability to stay asleep. In childhood, behavioral sleep problems are more com mon whereas in adults sleep related breathing problems occur frequently. Sleep disorders have a negative impact on general and mental health, behavioral and cognitive functions.

Increase in hyperactivity, aggression, irritability is seen in such children. It also contributes to family burden and more social isolation. (2,3,4,5,6,7) Sleep disturbances can accelerate the progression of dementia and Alzhei mer's in people with Down syndrome. Diagnosis and treatment of sleep disorders is thus essential to prevent further consequences and comorbidities. Improving overall sleep quality is the key in optimization of physical and cognitive functioning of children with this syn drome. (8)

This study is thus conducted to know the prevalence of sleep disturbances in children with Down syndrome at our hospital.

Methodology

Study design

We conducted a cross sectional Study on children with Down Syndrome attending our hospital.

Study period: Study was done during April 2023.

Place of study

Dept. of Pediatrics, Vani Vilas Children Hospital, BMC RI

Study population

Children aged between 1 to 18 years diagnosed with Down syndrome attending our hospital.

Data

Data was collected regarding the sleep habits of children with Down syndrome using Sleep Disturbances Scale for Children (SDSC).

Statistical analysis

Assessment tool were evaluated, variables were assessed using chi-square test. Association between categorical variables were assessed using chi-square test. There are 43 participants in this study (n=43). Shapiro-Wilk test was used to determine the normality of the data. CHI-SQUARE test was used to check the association between categorical variables. Continuous variables are expressed in terms of Mean, Std deviation (SD), Median, Inter quartile range (IQR). Categorical variables are expressed in frequency (n) and percentage (%)

Results

43 children with Down syndrome participated in the study. Participants were divided into two groups of 0-6 years and 6 -18years based on physiological sleep patterns. Of the 43 participants, 26 (60.5%) were below the age of 6 years and 17 (39.5%) were above 6 years of age. There were 20 (46.5%) girls and 23(53.5%) boys in the study. SDSC questionnaire was used to assess the sleep habits in these children. A score of 39 and above is considered to be significant.

Particular sleep problems were notable: 26 children (60.3%) needed an average of >30 minutes time to fall asleep. A score of >39 was seen in 11(48.4%) children which is of great concern. These disturbances were noted in both the age groups. Children aged > 6 years of age had marginally higher disorders of initiating and main taining sleep (mean of 12.04 and SD of 3.21) as compared to children aged below 6 years (mean of 10.41 with SD of 2.7). Excessive somnolence was seen more in children aged above 6 years (mean of 9.31 with SD of

1.64) that children below 6 years (mean of 8.94 with SD of 1.52).

	>6 years		< 6 years	
	Mean	SD	Mean	SD
DIMS	12.04	3.21	10.41	2.72
SBD	4.50	0.65	4.41	0.51
DA	3.34	0.58	3.31	0.77
SWTD	6.54	0.91	7.00	1.60
DOES	9.31	1.64	8.94	1.52
SHY	2.42	0.64	2.35	0.50
TOTAL	38.38	3.87	37.06	3.31

Discussion

Sleep is an essential component of overall health. Sleep is also necessary for overall mental and physical health as poor sleep habits can contribute to major and chronic health problems. Studies have shown that children with Down syndrome experience significant sleep problems. In our study we used a parent report questionnaire to assess these problems. SDSC is a 27item questionnaire which assesses the sleep habit of the child over the last 6 months. Questions specific to initiation and maintenance of sleep, breathing disorders, disorders of arousal, sleep wake transition disorders excessive somnolence and hyper hidrosis are asked.

Elisa Fuca et al conducted a retrospective cross-sectional study of sleep and behavioral problems in preschool children with Down syndrome at Pediatric Unit of Bam bino Gesu Children's Hospital, Italy between June to November 2021. 71 children aged 3 to 5.1 years were studied using SDSC scale and Child Behavior Checklist. Descriptive statistics were used to analyze demo graphi cal chara cteristics.15.4% exhibited significant sleep problems in this study and 14.1% showed behave oral problems (7). In our study, sleep difficulty was reported in 48.4% of the children. Disorders of initiation and maintenance of sleep and excessive somnolence were the most frequently seen. Other sleep disorders in children with Down syndrome include beathing disorders such as obstructive sleep apneas, hyperhidrosis in sleep and sleep wake transition disorders such as sleepwalking, sleep talking, bruxism etc.

Conclusion

Sleep disorders are commonly seen in children with Down syndrome and have a significant impact on the quality of life in these children. Early identification of such problems is thus necessary. Pediatricians should routinely enquire about sleep habits in such children and intervene early to avoid long term complications.

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