ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 03, pp.47428-47430, March, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

SLEEP DISORDERS IN ASTHMATIC CHILDREN: AN UNDER NOTICED ENTITY

***,[1]Hari Mohan Meena, [2]Sharma, B. S., [3]Prity Sharma and [4]Chetan Meena**

Senior Resident[1, 3, 4], Senior Professor[2], Department of Pediatrics, SMS Medical College, Jaipur, India

ARTICLE INFO

Article History:
Received 19th December, 2016
Received in revised form
14th January, 2017
Accepted 04th February, 2017
Published online 31st March, 2017

Key words:

Asthma,
Sleep disorders,
Restlessness sleep,
Snoring, Day time Sleepiness.

ABSTRACT

Objective: To evaluate to pattern and proportion of sleep disorders in asthmatic children aged 6 to 18 years.
Material & Method: It was a validated questionnaire based observational study, performed from May 2013 to April 2014 at department of pediatrics, Swai Man Singh (SMS) Medical College, Jaipur, India. We enrolled 63 asthmatic children age between 6 to 18 years.
Results: The **mean** age of study subjects was 10.2±1.5 year. The restlessness during sleep was found in 50.8% asthmatic children. The other sleep disorders among asthmatic children reported in our study was snoring during sleep (30.1%),Growing pains of legs when in bed (33.3%), difficulty falling asleep (30.2%), frequent nocturnal awakening (38%), grinding of teeth during sleep (28.5%), bed wetting during sleep (25.3%), perspiration during sleep(36.5%), sleepiness during day(44.4%) wake up with headache in morning(30.1%), sleep talking (31.7%) and sleep walking(17.4%).
Conclusion: The symptoms of sleep disorders in asthmatic children are prevalent. Common disorders are restlessness during sleep, growing pains of leg, difficulty in falling asleep, day time sleepiness, bed wetting during sleep, frequent nocturnal awakening and grinding of teeth.

Citation: Meena HM, Sharma BS, Sharma P and Meena C. 2017. "Sleep disorders in asthmatic children: an under noticed entity" *International Journal of Current Research*, 9, (03), 47428-47430.

INTRODUCTION

Bronchial asthma is most common chronic pulmonary disorder of children (Strachan, 1994). It is a chronic inflammatory disease of the airways. The chronic inflammation is associated with airway hyper responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning (GINA, 2006). The asthmatic children are predisposed to be having sleep disturbances. The nocturnal dyspnea and frequent wakefulness induce sleep deprivation, anxiety and poor quality of life in children suffering from bronchial diseases (Desager, 2005). Difficulties inducing sleep, sleep fragmentation on polysomnography, early morning awakenings and daytime sleepiness are more common in asthmatics compared with subjects without bronchial diseases. More than 40% of asthmatic children report clinically significant daytime sleepiness (Kieckhefer, 2009). Early identification of sleep disorders is important among children as they adversely affect the academic performances and cognitive function. Apart from this, sleep disorders in children also lead to cardiovascular disorders, metabolic diseases and neuropsychiatric disorders like attention deficit hyperactivity disorder (ADHD) (Tan, 2013).

Corresponding author:* **Hari Mohan Meena,
Senior Resident Department of Pediatrics, SMS Medical College, Jaipur, India.

Despite significant burden of sleep disorders in asthmatic children as co-morbidities and its long term adverse effect on health, the data is limited in Indian subcontinent. Therefore, we planned and designed a questionnaire based study to evaluate the pattern and burden of sleep disorders in asthmatic children.

MATERIALS AND METHODS

It was hospital based observational study, conducted at department of pediatrics, SMS Medical College, Jaipur, India from May 2013 to April 2014. Approval from the institutional ethical committee was obtained before performing the study. We enrolled 63 children aged 6 to 18 years in this study having clinician diagnosed persistent bronchial asthma without long term preventive therapy. Out of them 35 were male and 28 were female. We not enrolled the asthmatic children those were having craniofacial malformation, obesity, global developmental delay, neuromuscular disorders, cardiac diseases, taking treatment for asthma as preventing therapy in last six month and those were not willing to participate in study. After explaining the study purpose and the study protocol to the parents, an informed consent was obtained from the parents who were willing to participate in the study. The Hindi version of validated pediatric sleep questionnaire (PSQ) (Chervin, 2000) was supplied to parents of these children and it was filled by them. The PSQ is constructed by university of Michigan and also tested as well as validated against

Polysomnography. The necessary permission for its use and translate to Hindi language was obtained from the competent authority. Data thus collected were entered into Excel worksheet and classified as well as analyzed according to Objective. Analysis was done using SPSS v 21.0 for Windows (IBM Inc., USA).

RESULTS

The most prevalent sleep disturbance was restlessness during sleep (50.3%) in asthmatic children. Twenty four (38%) asthmatic children had reported frequent nocturnal awakenings. The asthmatic children presented with night time symptoms of sleep disorders were snoring during sleep (30.1%), growing pains of leg when in bed (33.3%), sleep talking (31.7%), sleep walking (17.4%), confusional arousal (19%), nightmares (8%), bruxism(28.5%), bed wetting during sleep(25.3%), periodic leg movement during sleep(27%), struggle to breath during sleep(22.2%), difficulty falling asleep(30.2%)and mouth breathing during sleep (20.6%).Perspiration during sleep reported by twenty three (36.5%) children. The nighttime symptoms of sleep disorders in asthmatic children were depicted in table no.1. The most common day time symptoms of sleep disorders in asthmatic children was sleepiness in day time (44.4%) which was identified either by parents or friends/ teacher followed by wake up with headache in morning(30.1%),unfreshness in morning(28.5%), taking nap during day that noticed either by parents or friends (22.2%), difficulty in waking up in morning(20.6%), sleepiness in classroom(19%) which reported by teachers to parents, mouth breathing during day(15.8%) and hyperactivity suggestive of ADHD(9.5%). Day time symptoms and behavior of asthmatic children revealed in table no.2.

Table 1. Nighttime symptoms of sleep disorders and sleep behavior during sleep in asthmatic children

Nighttime symptoms and sleep behavior	Asthmatic children having sleep disorders	
	%	Number
Snore during sleep	30.1	19
Restlessness during sleep	50.8	32
Mouth breathing during sleep	20.6	13
Growing pains when in bed	33.3	21
Frequent nocturnal awakening	38	24
Periodic leg movement during sleep	27	17
Perspiration during sleep	36.5	23
Difficulty falling asleep at night	30.2	19
Grinding of teeth during sleep	28.5	18
Bed wetting during sleep	25.3	16
Sleep talking	31.7	20
Sleep walking	17.4	11
Confusional arousal	19	12
Nightmares	12.6	8
Struggle to breathe during sleep	22.2	14
Stopping of sleep during sleep	9.5	6

Table 2. Daytime symptoms of sleep disorders and behavior of asthmatic children

Daytime symptoms and behavior	Asthmatic children having sleep disorders	
	%	Number
Mouth breathing during day	15.8	10
Sleepiness during day	44.4	28
Wake up with headache in morning	30.1	19
Unfreshness in morning	28.5	18
Difficulty waking up in the morning	20.6	13
Taking nap during day	22.2	14
Sleepiness in classroom	17.4	11
ADHD	9.5	6

DISCUSSION

The sleep disorders have significant impact on children in terms of quality of life, cardiopulmonary and neurocognitive function. The sleep disorders in asthmatic children are under recognized. This could be because of low awareness of sleep problems in these children. In our study, we found that half of asthmatic children had restlessness during sleep. C. Janson *et al*. (Janson, 1996) did report that forty four percent of young adult asthmatics had restlessness during sleep. It was one of the most common sleep disturbance patterns among young adult asthmatics in their study. They also reported that 24.7% asthmatic patients had difficulty in falling asleep. Which was statistically significant ($p<0.001$). Frequent nocturnal awakening is commonly reported among asthmatic patients. In current study we have observed that twenty four (38%) asthmatic children had frequent nocturnal awakening. Chugh *et al*, (Chugh, 2006) was conducted a case control, questionnaire based study in seventy school-going children at Vallabhbhai Patel Chest Institute, University of Delhi. He found that frequent nocturnal awakening was present in 38% asthmatic children and 30% had difficulty falling asleep. This was statistically significant ($p < 0.001$). They had also reported that daytime sleepiness (60%), early morning awakening (35%), involuntarily falling asleep (43%) and nightmare (10%) was present in asthmatic children. Frequent nocturnal awakening were also reported in 12% to19% in general population of school going children by some studies. They have included subjects in age group of 5 to 12 years (Smedje, 2001; Cai, 2008; Ravikiran, 2011; Li, 2014). Difficulty falling asleep is a common problem in asthmatic children (Chugh, 2006). In our study, we have noticed that one third of asthmatic children had experienced of difficulty in falling asleep. In present study, nocturnal enuresis was observed in sixteen (25.3%) asthmatic children. Gupta *et al*. (Gupta, 2016) did report that nocturnal enuresis was present in 9% of school going children aged 8 to 13 years. They also reported that snoring was present in 11.4% children and 6.3 children reportedly struggled to breathe during sleep. We must be noticed that nocturnal enuresis in children can be a sign of obstructive sleep apnea (OSA) (Tan, 2013). In current study symptoms of OSA like struggle to breathe during sleep (22.2%), perspiration during sleep (36.5%) and stop breathing during sleep (9.5%) were also observed. Snoring during sleep was present in fifteen (30.1%) asthmatic children in our study. Desager *et al*. (Desager, 2005), also noticed that almost fifty percent of their eighty three asthmatic children had snoring during sleep. They stated that upper airway obstruction was implicated as cause of snoring and OSA in asthmatic children. It has been postulated that nasopharyngeal inflammation with lower airways narrowing due to inflammation leads to adenoid and tonsillar hypertrophy which may lead to snoring and OSA.

Daytime sleepiness indicates the poor quality or lesser quantity of nighttime sleep. In present study, we have found that twenty eight (44.4%) of asthmatic children had daytime sleepiness. Chugh *et al*. (Chugh, 2006) reported that daytime sleepiness was in present in sixty percent of their asthmatic children. Desager *et al*. (Desager, 2005) too, observed that asthmatic children were five times more at risk of having daytime sleepiness as compared to non wheezing children. It has been found that daytime sleepiness has impact on poor academic performance and frequent nocturnal awakening (Li, 2014 and Salcedo Aguilar, 2005). Parasomnias like sleep walking (17.4%), sleep talking (31.7%) teeth grinding (28.5%) was also

present in our study. Gupta *et al*. (Gupta, 2016), have reported that the prevalence of parasomnias like sleep talking 20.9%, sleep walking 3.2% and teeth grinding 15.4% in school going children. Prevalent of symptoms of parasomnias and OSA in asthmatic children could be due to frequent nocturnal awakenings, poor sleep quality as well as quantity and daytime sleepiness in our study. Stores *et al*. (Stores, 1998), did compare subjective rating of sleep quality, daytime sleepiness, and cognitive function test in twenty one asthmatic children with healthy children. They found that asthmatic children had greater sleep disruption, more daytime sleepiness and lower cognitive function as compared to healthy children.

CONCLUSION

The significant proportion of asthmatic children had sleep disorders. The common symptoms of sleep disorders in asthmatic children are restlessness during sleep followed by daytime sleepiness, frequent nocturnal awakening, and growing pains of leg during sleep, difficulty falling asleep, snoring, bruxism, sleep talking and perspiration during sleep. We have recommended that every asthmatic child must be evaluated for sleep disorders.

CONTRIBUTIONS

BSS conceived the idea &designed the study.HMM was involved in data collection, data analysis & manuscript writing. PS did help in data analysis. CM did help in obtaining the permission of PSQ. HMM will act as guarantor of the article.

Conflict of Interest: None

Funding: None

Acknowledgement: None

REFERENCES

CaiY-M, Yi Z-W, Huang H, Li J-M, Luo X-M. Epidemiological investigation of sleep disorders for children at ages of 2-12 years in Changsha City. Zhongguo Dang Dai Er Ke Za Zhi. 2008; 10:353–6.

Chervin, R.D. 2000. Pediatric Sleep Questionnaire (PSQ): Validity & reliability of scales for sleep disordered breathing, snoring, sleepiness, and behavioral problems. *Sleep Medicine*: 1(1), 21-32.

Chugh IM, Khanna P, Shah A .Nocturnal symptoms and sleep disturbances in clinically stable asthmatic children. asian *pacific journal of allergy and immunology* 2006;24:135-142

Desager KN, Nelen V, Weyler JJ, De Backer WA. Sleep disturbances and daytime symptoms in wheezing school-aged children. *J Sleep Res* 2005; 14: 77-82.

GINA (Global Initiative for Asthma) – global strategy for asthma management and prevention-revised 2006. WWW. Ginasthma.org. 1-92

Gupta R, Goel D, Kandpal SD, Mittal N, Dhyani M, Mittal M. Prevalence of Sleep Disorders Among Primary School Children. *Indian J Pediatr.* 2016 Nov;83(11):1232-1236.

Janson C, De Backer W, Gislason T, Plaschke P, Björnsson E, Hetta J, Kristbjarnarson H, Vermeire P, Boman G Increased prevalence of sleep disturbances and daytime sleepiness in subjects with bronchial asthma: a population study of young adults in three European countries. *A Eur Respir J.* 1996 Oct;9(10):2132-8.

Kieckhefer, G.M., Lentz, M.J., Tsai, S.Y., Ward, T.M. Parent-child agreement in report of nighttime respiratory symptoms and sleep disruptions and quality. *J Pediatar Health Care*, 2009; 23(5) 315-326.

Li L, Ren J, Shi L, *et al*. Frequent nocturnal awakening in children: prevalence, risk factors, and associations with subjective sleep perception and daytime sleepiness. *BMC Psychiatry.* 2014;14:204.

Ravikiran SR, Jagadeesh Kumar PM, Latha KS. Sleep problems in preschool and school aged rural Indian children. *Indian Pediatr.* 2011; 48:221–3.

Salcedo Aguilar F, Rodríguez Almonacid FM, Monterde Aznar ML, García Jiménez MA, Redondo Martínez P, Marcos Navarro AI. Sleeping habits and sleep disorders during adolescence: relation to school performance. Aten Primaria. 2005;35:408–14.

Smedje H, Broman JE, Hetta J. Short-term prospective study of sleep disturbances in 5-8-year-old children. *Acta Paediatr.* 2001; 90:1456–63.

Stores G, Ellis AJ, Wiggs L, *et al*. Sleep and psychological disturbance in nocturnal asthma. Arch Dis Child 1998; 78:413-9.

Strachan DP, Anderson HR, Limb ES, *et al*. A national survey of asthma prevalence, severity and treatment in Great Britain. *Arch Dis Child* 1994; 70: 174-8.

Tan, H.L, Gozal, D., Kheirandish-Gozal, L. Obstructive sleep apnea in children: a critical update. *Nat Sci Sleep.* 2013;5:109–23.

****