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Evaluation of Sleep Disorders in Childhood Allergic Diseases

Çocukluk Çağında Alerjik Hastalıklarda Uyku Bozukluklarının Değerlendirilmesi

Azize Pınar METBULUT

Division of Pediatric Allergy and Immunology, Dr. Burhan Nalbantoğlu Hospital, Nicosia, Cyprus

ABSTRACT

Objective: Sleep is a vital component of human life that serves many critical roles in physical and mental health, and well-being. There were few studies on children, diagnosed with allergic diseases, especially preschool children. The aim of our study mas to evaluate sleep disorders in children with allergic diseases.

Material and Methods: This retrospective study was conducted in Dr. Burhan Nalbantoğlu Hospital Child Immunology and Allergy outpatient clinic between January 1 and March 20, 2024, patients included who were diagnosed with allergic rhinitis, asthma and/or atopic dermatitis.The 'Sleep Disturbance Scale for children (SDSC) was applied to the parents by the researcher during the outpatient clinic visit.

Results: In this study, 145 patients were involved. Five (3.4%) patients had clinically significant SDSC score. There was a statistically significant difference in the Children's Sleep Disturbance Scale mean score between having and not having symptoms of allergic diseases. Patients diagnosed wheezy child tended to have higher mean score of SHY. Among patients having symptoms of allergic diseases, there was statistically significant difference in the SDSC mean score between having nose congestion, cough, and activity limitation and not having these symptoms. Patients using oral antihistaminic treatment tended to have higher total mean scores of SDSC.

Conclusion: In this study, out of 145 patients, 5 (3.4%) patients had clinically significant SDSC score. Patients having symptom of allergic diseases tended to have higher total mean score of childrens' sleep disturbance scale. Patients diagnosed wheezy child tended to have higher mean score of SHY. Patients having nose congestion, cough, and activity limitation tended to have higher total mean score of SDSC.

Key Words: Allergic rhinitis, Asthma, Child, Sleep disorders

ÖZ

Amaç: Uyku, fiziksel ve ruhsal sağlıkta ve refahta birçok kritik rol oynayan insan yaşamının hayati bir bileşenidir. Literatürde alerjik hastalık tanısı alan çocuklarla, özellikle de okul öncesi çağdaki çocuklarla ilgili çok az çalışma sunulmuştur. Çalışmamızın amacı alerjik hastalığı olan çocuklarda uykku bozukluklarının değerlendirilmesiydi.

Gereç ve Yöntemler: Bu retrospektif çalışma, 1 Ocak-20 Mart tarihleri arasında Hastanemiz Çocuk İmmunoloji ve Alerji Polikliniği'nde alerjik rinit, astım ve/veya atopik dermatit tanısı konulan hastalar arasında gerçekleştirildi. Poliklinik ziyareti sırasında araştırmacı tarafından ebeveynlere 'Çocuklar için Uyku Bozuklukları Ölçeği (SDSC)' uygulanmıştır.

Bulgular: Bu çalışmaya 145 hasta dahil edildi. Beş (%3.4) hastada klinik olarak anlamlı SDSC skoru saptandı. Alerjik hastalık semptomu olan ve olmayan hastaların uyku bozukluğu ölçeği toplam puan ortalamaları arasında istatistiksel olarak anlamlı farklılık olduğu saptandı. Alerjik hastalık belirtileri olan hastalar arasında SDSC (değişmeyecek) toplam puan ortalaması ile burun tıkanıklığı, öksürük ve aktivite kısıtlılığı olan hastalar arasında istatistiksel olarak anlamlı fark olduğu saptandı. Oral antihistaminik tedavi kullanan hastaların ortalama skorları daha yüksek olma eğilimindeydi.

0000-0001-8823-5960 : METBULUT AP

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Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. The study was received from the ethics committee of KKTC Burhan Nalbantoğlu State Hospital. (approval number: E.K.13/24-15.04.2024).

***Contribution of the Authors / Yazarların katkısı*:** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar.

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Correspondence Address / Yazışma Adresi:
Azize Pınar METBULUT
Division of Pediatric Allergy and Immunology,
Dr. Burhan Nalbantoğlu Hospital, Nicosia, Cyprus
E-posta: pinar298@yahoo.com

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Sonuç: Bu çalışmada 145 hastanın 5'inde (%3.4) klinik olarak anlamlı SDSC (değişmeyecek) skoru saptandı. Alerjik hastalık belirtileri olan hastaların çocuk uyku bozukluğu ölçeği ortalama puanın daha yüksek olduğu görüldü. Burun tıkanıklığı, öksürük ve hareket kısıtlılığı olan hastaların ortalama SDSC (değişmeyecek) puanı daha yüksek olma eğilimindeydi.

Anahtar Sözcükler: Astım, Alerjik rinit, Çocuk, Uyku bozuklukları

INTRODUCTION

Sleep is a vital component of human life that serves many critical roles in physical and mental health, and well-being (1-3). Optimum sleep is important for the child's growth, development, learning, school performance, general health, and immune function (4-6).

Pediatric sleep disorders are common; their prevalence ranges from 10–28% (6). Sleep problems ranges from short-term difficulties in falling asleep to more serious sleep disorders such as obstructive sleep apnea (OSA) (7). Epidemiologic studies indicate that up to 50% of children experience a sleep problem, and about 4% have a diagnosis of formal sleep disorder (8).

Allergic diseases have a significant impact on quality of life. Globally, asthma and allergic rhinitis affects 4–10%, and 10–30% of the whole population respectively (9). In Cyprus, the prevalence of asthma and allergic rhinoconjunctivitis in children were 8.7-11.4% and 2.6-4.9% respectively (10). Atopic diseases, such as asthma, allergic rhinitis, and atopic dermatitis can influence sleep and following daytime functioning (11). In literature, it was observed that there was a statistically significant association between sleep disorders and allergy-related outcomes (12).

There were few studies on children, diagnosed with allergic diseases, especially preschool children (7,13,14). The aim of our study was to evaluate sleep disorders in children with allergic diseases.

MATERIALS and METHODS

This retrospective study was conducted in Dr. Burhan Nalbantoğlu Hospitals' Child Immunology and Allergy outpatient clinic between January 1 and March 20, 2024. This study included 145 patients who applied to the Pediatric Immunology and Allergy outpatient clinic and were diagnosed with allergic rhinitis, asthma and/or atopic dermatitis. Asthma was diagnosed according to Global Initiative for Asthma guideline (GINA) (15). Allergic rhinitis (AR) was diagnosed according to the Allergic Rhinitis and Their Impacts on Asthma (ARIA) guidelines (16). Atopic dermatitis was diagnosed according to Hanifin-Rajka criteria (17).

Inclusion criteria of the patients were determined as being followed in the Pediatric Immunology and Allergy outpatient clinic with asthma, allergic rhinitis, and/or atopic dermatitis, and being between 3 and 18 years age.

We collected data from medical records including medical history, demographic information such as age, gender, having additional allergic disease, and having concomitant chronic disease, and having symptoms, physical examination, laboratory findings, and treatments given. For asthma symptom control analyse, GINA assessment of asthma control for children were used (15).

The 'Sleep Disturbance Scale for children (SDSC) was applied to the parents by the researcher during the outpatient clinic visit (18, 19). The SDSC was originally validated on a sample of 1157 healthy children from the general population (18). According to Romeo and et al. (15), the internal consistency and the factor analysis support the use of SDSC as an evaluation tool even at preschool age (20). It investigates the occurrence of sleep disorders during the previous 6 months, and contains 26 items in a Likert- type scale with values 1-5 (higher numerical values reflect a higher frequency of occurrence of symptoms). The sum of scores provides a total sleep score with a possible range from 26 to 130. The original factor analysis yielded six sleep disturbance factors representing the most common areas of sleep disorders in childhood and adolescence: disorders of initiating and maintaining sleep (DIMS); sleep breathing disorders (SBD); disorders of arousal (sleepwalking, sleep terrors, nightmares) (DA); sleep wake transition disorders (SWTD); disorders of excessive somnolence (DOES); and sleep hyperhidrosis (SHY) (18). In this study, the Turkish version of SDSC, for which validity and reliability studies were conducted, were used (19).

The G*power 3.1.9.4 analysis program was used to calculate the sample size of this study. It was determined that at least 97 parents should participate in the sample of this study with an effect size of 0.30, a margin of error of 0.05%, df= 96 and 90% power. In total, one hundred and forty-five parents participated in this study.

This study was approved by our hospital Ethics Committee (approval number: E.K.13/24). Informed consent was obtained from all participants. Informed consent obtained from all parents who agreed to participate in the study.

Statistical Analysis

SPSS 22(SPSS Inc., Chicago, IL, USA) was used for statistical analyses. Results were expressed as percentile (absolute numbers), as mean and standard deviation, or as median and interquartile range (IQR) as required. Mann-Whitney test was used to compare the non- normally distributed continuous variables, and the independent t-test was used for normally

distributed continuous data. p<0.050 was considered statistically significant.

RESULTS

There were 145 patients in our study. Out of 145 patients, 90 (61.2%) were male. The median of the age of the children was 69 months (IQR:51-104.5). Forty-six (31.7%), 48 (33.1%), 95 (65.5%), 18 (12.4%), and 4 (2.8%) patients were diagnosed with asthma, wheezy child, allergic rhinitis, atopic dermatitis, and food allergy. Two (1.4%) patients had chronic disease, two were diagnosed as autism spectrum disorder (Table I).

Patients having symptoms of allergic diseases were 66.9% (n:97) of the patients. The common symptom was nasal congestion with a rate of 35.2 % (n:51) (Table I). In patients diagnosed with asthma, 24 (52.2 %) patients had commonly cough.

Out of the 145 patients, 107 (73.8 %) were using medication for allergic diseases. When the patients were evaluated in terms of the medicines used for allergic diseases, 75 (51.7 %), 54 (37.2%), 3 (2.1 %) and 28 (19.3 %) patients were using inhaled corticosteroid (ICS), nasal steroids, leukotriene antagonist, and oral antihistamines respectively (Table I).

Table I: Characteristics of the study population

Total Patient	145
Gender	
Male*	90 (61.2)
Female / Male	0.61
Age (months)†	69 (51-104.5)
Diagnosis of allergic diseases,*	
Allergic rhinitis	95 (65.5)
Wheezy child	48 (33.1)
Asthma	46 (31.7)
Atopic dermatitis	18 (12.4)
Food allergy	4 (2.8)
Concomitant chronic disease*	2 (1.4)
Autism	2 (1.4)
Patients not having symptoms*	48 (33.1)
Patients having symptoms*	97 (66.9)
Nasal Congestion*	51 (35.2)
Rhinorrhea	46 (31.7)
Itchiness in nose	35 (24.2)
Sneezing	32 (22.1)
Eye redness and discharge	9 (6.2)
Cough	49 (33.8)
Dyspnea	23 (15.9)
Activity limitation	12 (8.3)
Itchiness in skin	13 (9)
Rash	13 (9)
Patients using medication for allergic diseases*	107 (73.8)
Oral antihistamines	28 (19.3)
Nasal steroid	54 (37.2)
Inhaled steroid	75 (51.7)
Leukotriene antagonist	3 (2.1)

**: n(%), †: median and Interquartile Range (IQR)*

Table II: Evaluation of Sleep Disturbance Scale for Children

	Mean±SD	Min-Max
Total score	44±12.7	24-95
Disorders of initiating and maintaining sleep	13.4±4.5	7-30
Sleep Breathing Disorders	5.5±2.5	3-15
Disorders of arousal	6±2.7	3-15
Sleep-Wake Transition Disorders	9.7±4	4-27
Disorders of excessive somnolence	4.7±2.3	3-15
Sleep hyperhidrosis	4.2±2.5	2-10

Table III: Distribution of night sleeping time and falling asleep time of the children participating in this study.

Questions	n (%)
How many hours does your child sleep most nights?	
9-11 hours	61 (42.1)
8-9 hours	53 (36.6)
7-8 hours	24 (16.6)
5-7 hours	7 (4.8)
Less than 5 hours	0
How quickly does your child usually fall asleep after going to bed?	
Less than 15 minutes	63 (43.4)
Between 15-30 minutes	59 (40.7)
Between 30-45 minutes	13 (9)
Between 45-60 minutes	2 (1.4)
More than 60 minutes	8 (5.5)

'Sleep Disturbance Scale for Children' (SDSC) was applied to all parents. According to analysis, the mean of SDSC score was 44±12.7. The total SDSC score of 5 (3.4 %) children were clinically significant in terms of sleep disturbance (T-score >70). Among 5 children, three patient had asthma diagnosis, one patient had allergic rhinitis and, one had atopic dermatitis. Four patients were using medication for allergic disease. None of them had concomitant chronic disease.

The sub-dimensions of this scale were evaluated. The total of 110 (75.9 %) patients had an at least one abnormal SDSC subdimension score. The total score of DIMS were clinically significant in 9 (6.2 %) patients, SBD were in 28 (19.3 %), DA were in 97 (66.9 %), SWTD were in 18 (12.4 %), DOES were in 4 (2.8 %), and SHY were in 27 (18.6 %) patients. The mean of the 'DIMS' was 13.4±4.5. The mean of the 'SBD' was 5.5±2.5). The mean of the 'DA' was 6 ±2.7). The mean of the 'SWTD' was 9.7±4. The mean of the 'DOES' was 4.7±2.3. The mean of the 'SHY' was 4.2±2.5 (Table II).

The distributions of the children's sleeping times at night and how quickly they fell asleep after going to bed were shown in Table III. Commonly 61 (42.1 %) children were observed to sleep 9-11 hours most nights, and commonly 63 (43.4 %) children were observed to fall asleep less than 15 minutes (Table III).

There was significant statistical difference between age groups and DA score (p=0.007). Patient between 6-18 years age tended to have higher mean score of DA. There was no

Table IV: Comparison of children's sleep disturbance scale for children and subscale score averages according to the descriptive characteristics of patients

Variable	DIMS*	p†	SBD*	p†	DA*	p†	SWTD*	p†	DOES*	p†	SHY*	p†	Total*	p†
Age														
3-6 age	13±4.4	0.376	4.5±2.3	0.166	5±2.3	0.007†	8.5±3.5	0.255	4±2.2	0.355	4±2.6	0.414	43.5±11.4	0.838
6-18 age	13±4.6		5±2.6		6±3		10±4.5		4±2.5		3±2.5		42±13.9	
Gender														
Female	14±4.5	0.608	5±2.7	0.891	5±2.9	0.966	9±4.2	0.895	4±2.7	0.848	3±2.5	0.443	44±14.6	0.676
Male	12±4.5		5±2.3		5.5±2.6		9±3.9		4±2.1		4±2.6		42±11.4	
Diagnosıs of Allergic Diseases														
Wheezy child	13±3.8	0.334	5±2.1	0.756	5±2.4	0.187	9±3.7	0.557	5±2	0.418	4.5±2.6	0.009	44.5±9.9	0.405
Asthma	13±4.1	0.631	5±2.4	0.183	6±2.8	0.129	9±4	0.829	3.5±2.2	0.102	4±2.4	0.655	42±12.4	0.985
Allergic rhinitis	13.9±4.6	0.050	5.5±2.4	0.956	6.1±2.8	0.676	9.7±4	0.872	4.5±2	0.720	4.2±2.6	0.460	44±12.2	0.800
Atopic dermatitis	12.6±5.2	0.193	5.5±2.9	0.525	5.7±3	0.460	10±4.3	0.818	5.5±3.1	0.283	3.8±2.1	0.748	45±16	0.931
Symptoms of Allergic Diseases														
Patients not having symptom	12.6±3.9	0.117	5.1±2.2	0.232	5.2±23.	0.020	9.3±4.1	0.087	4.4±2.1	0.242	3.8±2	0.411	40.7±11.9	0.014
Patients having symptom	13.8±4.7		5.7±2.6		6.4±2.9		9.9±3.9		4.8±2.4		4.4±2.7		45.7±12.8	
Nose congestion	15±5.2	0.010	6±2.6	0.032	6.7±3.2	0.090	10.3±4.3	0.177	4.9±2.3	0.422	4.7±2.8	0.292	47.8±12.8	0.009
Runny nose	14.9±5.1	0.021	6.1±2.7	0.053	6.8±3.2	0.086	10.5±4.4	0.086	4.8±2.3	0.843	4.6±2.8	0.455	47.5±13.3	0.050
Itchiness in nose	14.6±4.2	0.036	5.8±3.1	0.775	6.4±3	0.555	10±3.6	0.226	4.6±1.8	0.907	4.6±2.9	0.586	46.6±13.1	0.239
Sneeze	14.4±4	0.076	5.8±3	0.935	6.5±3.1	0.572	10.2±4	0.255	4.5±1.7	0.775	5.1±3	0.077	47±13	0.190
Eye symptom	14.1±4.1	0.476	7±3.6	0.147	7.6±4	0.248	12±4.4	0.044	4.7±1.3	0.429	6.5±2.9	0.013	51.5±15.9	0.175
Cough	14.3±4.3	0.034	6±2.5	0.037	6.7±2.8	0.035	10.3±3.8	0.030	4.7±2.5	0.734	4.5±2.6	0.390	47±12.5	0.033
Dyspnea	13.6±4.6	0.929	6.8±2.7	0.010	6.2±3	0.975	10.7±4.7	0.205	5.1±3.1	0.949	4.9±3	0.398	47.7±15.11	0.245
Activity limitation	15.6±4.8	0.084	7.9±2.9	0.003	7±3.7	0.464	12.2±5.8	0.061	5.5±3.5	0.754	6.2±3.2	0.032	54.3±16.2	0.012
Itchiness in skin	11.6±4.2	0.064	4.8±2.1	0.256	5.3±2.2	0.331	9±2.2	0.833	4.6±2.1	0.705	4.3±2.8	0.964	42.3±11.2	0.527
Rash	11.5±4.2	0.045†	4.9±2.1	0.366	5.3±2.1	0.276	8.9±2.2	0.691	4.6±2.1	0.944	4.2±2.8	0.829	41.9±11.3	0.416
Patients Given Treatment For Allergic Diseases														
Patients not given treatment	13.5±4.7	0.975	5.3±2.6	0.377	6±2.5	0.708	8.9±2.6	0.430	4.6±2.6	0.311	4±2.5	0.536	43.7±12.3	0.862
Patients given treatment	13.4±4.4		5.5±2.4		6±2.8		10±4.4		4.7±2.2		4.3±2.6		44.2±12.8	
Oral antihistamine	14.5±5.4	0.225	6±3.1	0.620	7.5±3.4	0.009	11.4±3.9	0.002	5.7±2.6	0.002	4.3±2.8	0.918	49.8±15.1	0.020
Nasal steroid	13.5±4	0.475	5.7±2.5	0.233	6.2±2.9	0.585	9.8±4.3	0.869	4.6±1.8	0.410	4.1±2.6	0.421	44±11.3	0.793
İnhaled steroid	13±3.8	0.773	5.4±2.1	0.626	5.6±2.5	0.111	9.8±4.2	0.823	4.6±2.1	0.739	4.6±2.5	0.024	43.3±11.4	0.739
Leukotriene antagonist	16.6±3.7	0.123	6.6±2.3	0.293	7.6±3.7	0.343	9.6±2.5	0.669	3.3±0.5	0.215	6±3.4	0.215	48.6±10.2	0.408

:** *mean±SD*, **†:** *Mann-Whitney U test*, ***DIMS: *Disorders of initiating and maintaining sleep*, ***SBD:*** *Sleep Breathing Disorders*, ***DA:*** *Disorders of arousal*, ***SWTD:*** *Sleep-Wake Transition Disorders*, ***DOES:*** *Disorders of excessive somnolence*, ***SHY:*** *Sleep Hyperhidrosis*

significant statistical difference between gender, and SDSC total score and subdimensions score (Table IV).

There was significant statistical difference between having symptom of allergic diseases and SDSC total mean score (p=0.014). Patients diagnosed wheezy child tended to have higher mean score of SHY (p=0.009). There was no significant statistical difference between having asthma, AR, and atopic dermatitis, and subdimensions mean scores (Table IV).

Among patients having symptoms, there was significant statistical difference between SDSC total mean score, and having nose congestion, cough, and activity limitation (p=0.009, 0.033, and 0.012 respectively). Patients having allergic symptom tended to have higher mean score of DA (p=0.020). Patients having nose congestion tended to have higher mean scores of DIMS and SBD (p=0.010, and 0.032 respectively). Patients having runny nose tended to have higher mean scores of DIMS (p=0.021). Patients having itchiness in the nose tended to have higher mean scores of DIMS (p=0.036). Patients having eye symptom tended to have higher mean scores of SWTD and SHY (p=0.044, and 0.013 respectively). Patients having cough tended to have higher mean scores of DIMS, SBD, DA, and SWTD (p=0.034, 0.037, 0.035, and 0.030 respectively). Patients having dyspnea tended to have higher mean scores of SBD (p=0.010). Patients having activity limitation tended to have higher mean scores of SBD and SHY (p=0.003, and 0.032 respectively). Patients having rash tended to have higher mean scores of DIMS (p=0.045). (Table IV).

There was significant statistical difference between SDSC total score and patients using oral antihistamine treatment (p=0.020). Patients using oral antihistamine treatment tended to have higher mean scores of DA, SWTD, and DOES (p=0.009, 0.002, and 0.002 respectively). Patients using ICS treatment tended to have higher mean scores of SHY (p=0.024) (Table IV).

DISCUSSION

In this study, 5 (3.4 %) of 145 patients had clinically significant SDSC score. There was statistically significant difference in SDSC scores between having or not having symptom of allergic diseases. Patients diagnosed wheezy child tended to have higher mean score of SHY. Among patients having symptoms of allergic diseases, there was statistically significant difference in SDSC score between having nose congestion, cough, and activity limitation and not having these symptoms. Patients using oral antihistamine treatment tended to have higher total mean scores of SDSC.

Causes of sleep disorder in patients having allergic disease may be due to increase in symptoms of the underlying disease, such as cough in asthma, runny nose, congestion and postnasal drip in allergic rhinitis; increase in itching sensation at night in patients with atopic dermatitis; failure to comply with treatment recommendations that causes an increase in symptoms. These factors can lead disrupting sleep, and cause daytime sleepiness, fatigue, decrease in cognitive and psychomotor abilities, and increase difficulty in concentration (11).

According to Sherrey et al. (21), it was observed that allergic rhinitis was associated with sleep routine problems, morning tiredness, night arousals, sleep disordered breathing and restless sleep; asthma with sleep routine problems, sleep disordered breathing and restless sleep; and eczema with restless sleep (21). In another study, children having poorer asthma and allergic rhinitis had higher levels of sleep problems (22). According to Ma et al., out of 4876 preschool children, it was observed that frequent nocturnal awakening was statistically higher in children diagnosed with asthma and allergic rhinitis (13).

In a meta-analysis, sleep disorders are associated with an increased prevalence and incidence of asthma (23). In another study, it was observed that asthmatic children reported increased nocturnal symptoms, sleep disturbances and poorer sleep quality (24). In our study, patients diagnosed wheezy child tended to have higher mean score of SHY (p=0.009). There was no statistically significant difference in SDSC score between having asthma diagnosis and not. According to Furtado et al., a better quality of life was observed in children with lower SDSC total score and lower levels of dyspnea (25). In our study, patients having dyspnea tended to have higher mean scores of SBD (p=0.010).

According to Loekmanwidjaja et al. (26), it was observed that children with moderate to severe persistent allergic rhinitis had a higher frequency of sleep disorders than healthy controls, particularly concerning nocturnal breathing disorders, daytime sleepiness, and parasomnias. However, patients having nose congestion, runny nose, and itchiness in the nose tended to have higher mean scores of DIMS. Patients having eye symptom tended to have higher mean scores of SWTD and SHY.

Atopic dermatitis (AD) is associated with sleep disturbances in 47% to 80% of children (27). According to Ramirez et al. (28), children with mild atopic dermatitis or inactive atopic dermatitis had significantly more impaired sleep quality than healthy children. Children with active AD, reported worse sleep quality, and patients having concomitant allergic rhinitis and/or asthma had worse sleep quality (28). In our study, there was no statistically significant difference between having atopic dermatitis and not in terms of SDSC total and subdimensions' mean score. However, patients having rash tended to have higher mean scores of DIMS.

CONCLUSION

In this study, out of 145 patients, 5 (3.4 %) patients had clinically significant SDSC score. Patients having symptom of allergic diseases tended to have higher total mean score of childrens' sleep disturbance scale. Patients diagnosed wheezy

child tended to have higher mean score of SHY. Patients having nose congestion, cough, and activity limitation tended to have higher total mean score of SDSC.

Physicians should pay particular attention to sleep quality in children with allergic diseases. It is recommended that further studies be carried out to identify sleep disorders and affecting factors and to improve these conditions, and to provide education and consultancy services to parents on these issues.

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