



Screening for sleep-disordered breathing with paediatric sleep questionnaire in Indian children

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Abstract

Background: Obstructive sleep apnea (OSA) is a serious medical condition, having various long-term effects on a child's well-being. Though, very few epidemiological data are only present for the Indian children who could be at risk for this condition.

Aim & Objectives: The aim of the study was to determine children aged 2-14 years who are at risk to develop OSA using the Paediatric Sleep Questionnaire (PSQ)

Materials & Methods: Questionnaire containing twenty two queries is given to the Parents of kids. Children who had eight “yes” responses of twenty-two queries got a PSQ score ≥ 0.33 and were thought about the OSA risk cluster. The collected knowledge are statistically analyzed.

Results: Mean age of the study population was 7.39(\pm 3.19) years, with additional range of male kids as compared to female kids within the study sample. A total of three hundred children participated within the study.

Out of these fifty children had answered affirmative for over eight queries. The proportion of male and female is found to be (20 male and 30 female).

Conclusion: Fifty children were considered to be at risk to develop OSA and referred for sleep study. In this study, we suggest that PSQ-22 Questionnaire can be used as a screening tool to evaluate the risk of OSA in young Indian children.

Keywords: Obstructive Sleep Apnoea, Sleep Disordered Breathing, Sleep Questionnaire

Introduction

Recordable, intermittent, partial, or complete tubular cavity airway obstruction throughout sleep is the landmark of impeding obstructive sleep apnea syndrome (OSAS), that represents the foremost severe style of impeding Sleep Disordered Breathing.[1]

Pediatric obstructive sleep apnea (OSA) and Sleep Disordered breathing (SDB) square measure additional complicated and complex sickness than its adult counterpart. The STOP-BANG questionnaire form has been researched as by characteristic unknown or otherwise unrecognized adult screening tools for OSA. However it can't be applied to youngsters as a result of the medicine nomograms for neck circumference square measure solely partly established during this form. [2]

SDB may be a time of sleep-related disturbances in higher airway obstruction starting from primary snoring, the mildest type, to impeding apnea syndrome, the severe type. The prevalence of OSAS in youngsters ranges from 1.2 to 5.7% .It carries a perioperative morbidity and mortality that so much exceeds its incidence within the population.[3]

Obstructive sleep apnea syndrome in youngsters possess different effects as compared to impeding apnea syndrome in adults, as well as deficits in noesis,

psychology functions, behavior issues, learning issues and nocturnal incontinency.[4]

The consequences of impeding Sleep disordered respiration includes disorders of the vessel, central nervous system, enuresis, growth disorders and reduced quality of life. The diagnostic gold normal for impeding SDB is all-night polysomnography (PSG). The procedure is expensive, and its availableness is short even in extremely developed countries. This can delay correct identification and treatment of the condition. [5]

Hence the need of hour is a predictor to quickly assess the risk of early OSA in children and avoid long-term effects. In this study, we've used pediatric sleep questionnaire (PSQ -22) as a screening tool for sleep disordered respiration in Indian youngsters at intervals of two to fourteen years.

Materials and Methods

Study Design: This is a Prospective Questionnaire study performed at the department of Oral and Maxillofacial Surgery at SRM Kattankulathur Dental and Medical college between September 2019 and October 2020 in parents of children aged between 2- 14 years. The study comprised of a sample size of 300 patients.

Methodology

Questionnaire containing twenty two queries are given to the parents .Children that had eight "yes" responses of twenty-two queries got a PSQ score ≥ 0.33 and were thought about the OSA risk cluster. The collected knowledge is statistically analyzed.

Inclusion criteria

- Patients who reported to SRM Kattankulathur Dental and Medical College.
- Patient's Parents with a literacy level to read and write English or Tamil language fluently

- Parents of children who are willing to participate in the study.

Exclusion criteria

- Unable to read and write English or Tamil Language.
- Children not within the age of 2 – 14 years
- Children with serious systemic conditions
- Not willing to participate

Results:

Frequencies

Table 1: Mean and variance Age of the kids.

Age of the child		
	N	300
Mean		7.39
Std. Deviation		3.192
Minimum		2
Maximum		14

Table 2: Mean and variance among Female

Statistics	
Age – Female	
N	144
Mean	7.10
Std. Deviation	3.329
Minimum	2
Maximum	14

Table 3: Mean and variance among Male

Statistics	
Age – Male	
N	156
Mean	7.67
Std. Deviation	3.046
Minimum	2
Maximum	14

Table 4: Pearson Chi-Square test

Pearson Chi-Square Tests		
		Gender of the child
Question 1	Chi-square	0.024
	df	1
	Sig.	0.878
Question 2	Chi-square	1.236
	df	1
	Sig.	0.266
Question 3	Chi-square	2.221
	df	1
	Sig.	0.136
Question 4	Chi-square	1.116
	df	1
	Sig.	0.291
Question 5	Chi-square	1.745
	df	1
	Sig.	0.187
Question 6	Chi-square	0.492
	df	1
	Sig.	0.483
Question 7	Chi-square	0.012
	df	1
	Sig.	0.913
Question 8	Chi-square	0.045
	df	1
	Sig.	0.832
Question 9	Chi-square	0.323
	df	1
	Sig.	0.57
Question 10	Chi-square	0.419
	df	1
	Sig.	0.517
Question 11	Chi-square	0.855

	df	1
	Sig.	0.355
Question 12	Chi-square	3.017
	df	1
	Sig.	0.082
Question 13	Chi-square	2.199
	df	1
	Sig.	0.138
Question 14	Chi-square	4.244
	df	1
	Sig.	0.039
Question 15	Chi-square	1.424
	df	1
	Sig.	0.233
Question 16	Chi-square	6.731
	df	1
	Sig.	0.009
Question 17	Chi-square	1.452
	df	1
	Sig.	0.228
Question 18	Chi-square	0.715
	df	1
	Sig.	0.398
Question 19	Chi-square	0.028
	df	1
	Sig.	0.868
Question 20	Chi-square	0.323
	df	1
	Sig.	0.57
Question 21	Chi-square	2.249
	df	1
	Sig.	0.134
Question 22	Chi-square	8.654
	df	1
	Sig.	0.003

This table explains regarding the chi square value for every query on an individual basis. In this, p price is a smaller amount than 0.05 in 3 queries (q.no 14, 16, 22).If , p-value is smaller than 0.05, we can conclude that there's an association between the respondent preferences among gender.

Statistical Analysis

The output of the information was collected and statistically calculable by the software system package RStudio 1.3.1073 and SPSS 16. Knowledge was given victimization Descriptive statistics and chi sq. analysis. The extent of significance was set at $p < 0.05$.

A total of three hundred children participated inthe study. Mean age of the study population was $7.39(\pm 3.19)$ years, with additional range of male as compared to female within the study sample.

Descriptive applied mathematics analyses were performed to the frequencies and corresponding percentages. Chi-square check was performed to search out the associations. $P < 0.05$ was thought of to be statistically vital. The distribution of male and female within the OSA risk cluster was tabulated, and an association was obtained from the questionnaires.

A total of three hundred children participated within the study. Out of these fifty children has answered affirmative for over eight queries. The proportion of male and female is found to be (20 male and 30 female).

Table 5: Gender wise answering preference (in %) Female

2 to 5	14	5%
6 to 10	12	4%
11 to 14	4	1%

From the Table 5 it is seen that the child between the age group of (2 to 5) has answered ‘yes’ for more than 8 questions with the highest of 5% for female.

Table 6: Gender wise answering preference (in %) Male

2 to 5	2	1%
6 to 10	18	6%
11 to 14	0	0%

From the Table 6 it is seen that the child between the age group of (6 to 10) has answered 'yes' for more than 8 questions with the highest of 6% for male.

Table 7: Overall comparison

2 to 5	16	5%
6 to 10	30	10%
11 to 14	4	1%

From the overall comparison Table 7 we can say that approximately 17% of child has answered 'yes' for more than 8 questions. The proportion of male was 7% and female was 10%. And the child between the age group (6-10) has answered 'yes' for more than 8 questions with the highest of 10%.

From the chi-square analysis, we found that among 22 questions only 3 questions had the association between genders. In this, Q. no 14 and 22 had an association between answering preference among gender, with the highest proportion of female with 8 and 60 children respectively. And Q.no 16 also had an association among gender with the highest proportion of male with 16 children

Discussion

The management of snoring and OSA is variable across the world. There's some inconsistency with respect to the assessment of medical specialty snoring and OSA.[6]

Parents showing depression, agitation and anxiety, particularly as a results of teasing youngsters (like in OSAS patients), influences their youngsters in daily life. youngsters United Nations agency have OSA because of adenotonsillar hypertrophy show symptoms like snoring, panting for air, and respiration stop, which is unsettling

for his or her oldsters and produces high levels of agitation, depression and anxiety[7].

OSA is a complex disease entity that has long term effects on health-related Quality of life in children. The impact of OSA extends beyond sleep parameters to affect children's behavior, daytime functioning, and family life. [8]

Panchanok kaewkul et al stated that, when not correctly treated, severe OSA will result in many complications. Though Polysomnography (PSG) is the accepted gold customary of the diagnostic assay, there are still limitations like its scarce accessibility because of the long roster and high price. Therefore, simpler, cheaper, and quicker screening tools are required for kids, significantly once suspected for severe OSA, which needs imperative diagnosis and treatment.[9]

While PSG is incredibly costly, it's the sole definitive approach for designation paediatric OSA. Researchers have planned efficient and convenient screening tools, like questionnaires, nap-PSG, at-home unattended PSG, home based oximetry, and videotape recording. The validity of those instruments is proscribed though they still be investigated as screening tools for OSA. Our work is most closely associated with Shikara et al., United Nations agency compared 2 sets of questionnaires, the changed Epworth drowsiness Scale (SLS) and Paediatric Sleep Questionnaire form (PSQ). Their study shows that PSQ outperforms SLS, and therefore the authors have prompt that victimization forms with alternative clinical measures for higher accuracy according to similar results for the OSA-18 questionnaire.[10]

The OSA-18 could be a wide used form in paediatric sleep medication and Otorhinolaryngology. It had been originally developed as a disease-specific quality of life tool but the total score has subsequently been

demonstrated to have poor validity in determining the presence or severity of OSA as defined by PSG. It's thus not appropriate to guide medical aid choices based on the severity of OSA. They developed associated valid 11-item form, and so improved it to a 5-item abbreviated version, with the latter having sensible sensitivity and negative prophetic price for the presence of OSA. The OSA-5, with fewer queries and an additional restricted Likert scale. This straightforward tool performs well as a screening tool and is thus useful as sorting tool for giant scale referrals for the common symptoms of sleep disordered respiration.[11]

According to Abumuamar et al the performance of a six-item and two-eight-item scales in a very medical specialty cohort at a sleep clinic. The six-item scale exhibited more specificity of 95% and the eight-item IF-SLEEPY scale displayed 82% sensitivity for diagnosing obstructive sleep apnea. Each questionnaire was found to be sensible predictors of the presence of OSA on multivariate analysis models. This study suggests that the eight-item scale is a better screening tool for paediatric obstructive sleep apnea, with a simple yes/no responses that are easy to complete and to score. The limitation of the study is that both questionnaires have overall low specificities for diagnosing paediatric OSA. [12]

Constantin et al evaluated the sensitivity associated NPV of the OSA-18 to an objective live for moderate-to-severe OSA. Their study only compared the OSA-18 to alternative subjective information. This study indicates that OSA-18 Questionnaire is not ready to accurately notice moderate-to-severe OSA in youngsters and, thus, is not an acceptable replacement for objective testing for paediatric OSA. [13]. In a study done by Yu-Hsuan Lee et al, the educational institution youngsters with OSA suffered additional behavioural and emotional issues. Moreover, this study also showed that day time

somnolence was not a standard characteristic in educational institution youngsters with delicate OSA.[14] There is no vital association between PSQ and gender of the patients but the proportion of males in OSA risk cluster was beyond that of females This was proven in study done by Jalan et al which is also in accordance with studies done by Anuntaseree et al, Kelmanson et al and Corbo et al .[15] Whereas in our study, from the chi-square analysis, we found that among 22 questions 3 questions had the association between gender. In Table 7 Q.no 14 and 22 had an association between answering preference among gender , with the highest proportion of female with 8 and 60 children respectively . And Q.no 16 also had an association among gender with the highest proportion of male with 16 children. Our study also had OSA risk cluster higher in males than female.

The limitation of the study is the single centre design of the study. Another limitation is the sample size. Since it's a single centre study, the sample size was limited. The questionnaire was completed by parents of children who reported to General and Dental hospital for any treatment other than sleep issue.

Conclusion

As OSA has significant adverse physical, mental and academic consequences, and is readily treatable, we believe it is necessary to do sleep study for all children. However, PSG is expensive , and its availableness is short even in extremely developed countries. This can delay correct identification and treatment of the condition. Hence the main purpose of the questionnaire is to identify and refer the children with risk of OSA for sleep studies. This can avoid development of OSA and its further consequences in young children. A total of three hundred children participated within the study. Out of these fifty children has answered affirmative for over eight queries and were further evaluated and referred for

sleep study. In this study, we conclude that PSQ-22 Questionnaire can be used as a screening tool to evaluate the risk of OSA in young Indian children.

Ethical Statement: The study is approved by SRM ethical committee and all parents of children have been informed about the Questionnaire study. Informed Consent was obtained.

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