

Simplification of the severity hierarchy score for pediatric sleep apnea screening

Short
communication

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ABSTRACT

Pediatric Obstructive Sleep Apnea is a common condition. However, it remains under diagnosed exposing to associated morbidities. Polysomnography is the standard diagnostic test, but its availability is sometimes limited, especially in poor countries.

The questionnaire proposed by Spruyt and Gazal has been validated as a screening tool by many studies. A score above 2.75 have an 82% sensitivity, a 81% specificity and a negative predictive value of 92% for detecting moderate OSA. However, the way of calculating the score seems to us rather complicated and may limit its use in daily practice.

Therefore, we propose, for calculating the score, a table that may be printed in sheets of paper. We propose a simple modification that could, in our opinion; greatly facilitate the use of this screening tool by reducing the use of calculators and the risks of errors. In this way, we hope to make its use much easier in everyday practice.

Key Words: Children, obstructive sleep apnea, questionnaire

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Obstructive Sleep Apnea (OSA) is a common condition affecting 1 to 4% of the general pediatric population. However, it remains under diagnosed exposing to associated morbidities, mainly cardiological, cognitive, and metabolic^[1]. Polysomnography is the standard diagnostic test, but its availability is sometimes limited, especially in poor countries.

The questionnaire proposed by Spruyt and Gozal^[2] has been validated as a screening tool by many studies^[1-5]. A score above 2.75 have a 82% sensitivity, a 81% specificity and a negative predictive value of 92% for detecting moderate OSA^[4]. Parents have to answer six questions:

Q1: do you ever need to shake your child to make him/her breathe again when asleep?

Q2: does your child stop breathing during sleep?

Q3: does your child struggle to breathe while asleep?

Q4: are you ever concerned about your child's breathing during sleep?

Q5: how loud is the snore?

Q6: how often does your child snore?

The questions are answered using the following scale: never = 0; rarely = 1 (once per week); occasionally = 2

(twice per week); frequently = 3 (three-four times per week); and almost always = 4 (>four times per week). Except the fifth question, that is answered using the following scale: mildly/quiet = 0; medium loud = 1; loud = 2; very loud = 3; and extremely loud = 4.

According to the formula developed by Spruyt and Gozal, the questionnaire score (S) represents the average score of the six questions, graded according to a hierarchy of severity: $A=(Q1+Q2)/2$, $B=(A+Q3)/2$, $C=(B+Q4)/2$, $D=(C+Q5)/2$ and the cumulative score $S=(D+Q6)/2$.

However, this way of calculating the score seems to us rather complicated and may limit its use in daily practice. It is true that clinicians may use an automatic calculator using spreadsheets applications for example; however, access to a computer or even a smartphone is not always easy during an outpatient visit especially in poor countries.

On the other hand, according to the formula:

$$S = (((((Q1 + Q2)/2 + Q3)/2 + Q4)/2 + Q5)/2 + Q6)/2$$

$$\text{So } S = Q1/32 + Q2/32 + Q3/16 + Q4/8 + Q5/4 + Q6/2$$

$$\text{Or } S = (Q1 + Q2 + 2*Q3 + 4*Q4 + 8*Q5 + 16*Q6)/32$$

Therefore, we propose to convert the questionnaire into (Table 1), this table may be printed in sheets of paper.

It is then easy to circle the appropriate numbers in each line and to calculate on the paper their sum giving a new

score ranging from zero to 128, with a cutoff score of 88 (=2.75*32) predictive of moderate OSA.

Table 1: Our proposed table

	never	once per week	twice per week	3-4 times per week	>4 times per week
do you ever need to shake your child to make him/ her breathe again when asleep	0	1	2	3	4
does your child stop breathing during sleep	0	1	2	3	4
does your child struggle to breathe while asleep	0	2	4	6	8
are you ever concerned about your child's breathing during sleep	0	4	8	12	16
how often does your child snore	0	16	32	48	64
how loud is the snore	mildly/quiet 0	medium loud 8	loud 16	very loud 24	extremely loud 32

It is obvious that it is a simple modification, but that could, in our opinion; greatly facilitate the use of this screening tool by reducing the use of calculators and the risks of errors. In this way, we hope to make its use much easier in everyday practice.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTIONS

All authors contributed in writing the manuscript, they read and approved the final manuscript.

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