Correspondence

Prevalence of obstructive sleep apnea in children with sickle cell disease at a tertiary hospital in Saudi Arabia

To the Editor

I have 3 comments on the interesting study by Al-Otaibi et al[1] on the prevalence of obstructive sleep apnea (OSA) in children with sickle cell disease (SCD) in the Kingdom of Saudi Arabia (KSA).

First, based on nocturnal polysomnography (PSG) parameters, Al-Otaibi et al found that the prevalence of OSA in the studied SCD cohort was 80% using an apnea hypopnea (AH) index cutoff of ≥1 and 7.7% using AH index cutoff of ≥5.[1] Apart from few limitations addressed by Al-Otaibi et al,[1] I presume that the following 2 points are additionally contributory and might cast some suspicions on the accuracy of the study results. 1) Al-Otaibi et al mentioned that 90.8% of the studied SCD patients had sickle cell anemia (SCA).[1] However, they did not address the OSA prevalence in the patients with hemoglobin S (Hb S), or Hb S along with other Hb variants that allow for Hb S polymerization. This point is important to be considered. For instance, an American study has found that PSG parameters differed significantly between Hb SS and Hb SC genotypes only on arterial oxyhemoglobin saturation (SpO_2; 95.2±3.8 versus 98.0±0.8, $p<0.01$) and percentage of sleep time below SpO_2 90% (T90; 8.0±22.0 versus 0.01±0.02, $p<0.05$).[2] The study concluded that children with Hb SS experienced more severe nocturnal oxygen desaturation than did those with Hb SC.[2] Thus, different genotypes of SCD are expected to alter the estimated PSG parameters in the Al-Otaibi et al's study.[1] 2) It was not obvious in the methodology that the studied SCD patients were on treatment, particularly hydroxyurea (HU) or not. This point is important to be considered as the increase in the use of HU in the treatment of SCD has triggered studying its impact on the prevalence of OSA and nocturnal hypoxia in SCD children. A set of researchers have found that OSA was diagnosed in 38% in the HU group and 52% in the no-HU group ($p=0.14$). The median AH index was 0.9 and 1.9 events/h in the HU group and the no-HU group, respectively ($p=0.28$). The HU group compared with the no-HU group had a significantly higher median awake SaO_2 (98.6 and 96.2%, respectively; $p<0.0001$), a significantly higher median sleep SaO_2 (98.4 and 96.1%, respectively; $P<0.001$), and a significantly higher nadir SaO_2 while asleep (91.4 and 85.0%, respectively; $p=0.0002$).[3] The researchers concluded that improving nocturnal SaO_2 maybe an important mechanism of action of HU therapy.[3] Thus, HU therapy received by the SCD cohort in Al-Otaibi et al's study, if any, is expected to alter the estimated PSG parameters. Despite the aforementioned limitations, the reported OSA in Otaibi et al's study[1] is alarmingly high.

Second, based on employing pediatric sleep questionnaire (PSQ), Al-Otaibi et al found a history of snoring for more than half the time during sleep in 73.8% children (of these 64.6% had an AHI ≥1), a history of apnea during sleep in 32.8% (71.4% had an AHI ≥1), and bed wetting in 46% (62.1% had an AHI ≥1).[1] It noteworthy that PSQ is an old questionnaire developed and validated by Chervin et al in 2000[4] and it has a sensitivity of 81% and a specificity of 87%. New questionnaires have been developed to detect patients at risk of OSA and among them, STOP-Bang questionnaire (SBQ) has received universal attention. Systematic review and meta-analysis to determine the effectiveness of SBQ for screening patients suspected of having OSA and to predict its accuracy in determining the severity of OSA in different populations confirmed the high performance of the SBQ in the sleep clinic.[5] The sensitivity was estimated to be 90%, 94%, and 96% to detect any OSA (AHI ≥5), moderate-to-severe OSA (AHI ≥15), and severe OSA (AHI ≥30) respectively while the corresponding negative predictive value (NPV) was 46%, 75%, and 90%.[5] Interestingly, the validity and reliability of the Arabic version of SBQ as a screening tool for OSA has been evaluated in KSA and it showed that it is an easy-to-administer, simple, reliable, and valid tool for the identification of OSA in the sleep disorders clinic setting.[6] It exhibited a high degree of internal consistency and stability over time for the translated SBQ. The Cronbach's alpha coefficient for the 8-item tool was 0.7. Validation of the SBQ against the AHI at a cut-off of 5 revealed a sensitivity of 98% and positive and NPV of 86% and 67%, respectively.[6] I wonder why Otaibi et al[1] referred to PSQ instead of SBQ in their study. I presume that if Otaibi et al[1] employed SBQ in the methodology, the study results might be altered.

Third, the American Academy of Pediatrics recommends that all children be screened for symptoms and signs suggestive of OSA and complex cases should be referred to the specialist for further evaluation. In the view of prevailing SCD in KSA, high prevalence of OSA in Saudi SCD children,[1] and elevated morbidity and health care use in children with OSA, I presume that routine screening SCD patients for OSA needs to receive particular attention by policy makers in KSA in order to decrease the morbidity, and consequently improve the quality of life in SCD patients.

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Reply from the Author

No reply was received from the Author.

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