PREDICTION OF OBSTRUCTIVE SLEEP APNOEA IN CHILDREN WITH DOWN SYNDROME

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Background: Obstructive sleep apnoea (OSA) is a highly prevalent sleep disorder in children with Down syndrome (DS). Clinical guidelines recommend that all children with DS have polysomnography (PSG) for assessment of OSA. However, access is limited and testing may be burdensome for children and families, and hence compliance with guidelines is incomplete. The purpose of this study was to identify a model to predict OSA that may be used to triage children with DS for PSG.
Methods: Forty-four children with DS aged 3-19 years were studied. Potential predictive variables included age, gender, anthropometric measurements, actigraphy measures and questionnaires associated with OSA-related quality of life (OSA-18), behaviour (Child Behavior Checklist), daytime functioning (Adaptive Behavior Assessment System), sleep related disorders (Pediatric Sleep Survey Instrument sleep disordered breathing sub-scale [PSSI-SDB]) and excessive daytime sleepiness (Epworth Sleepiness Scale for Children and Adolescents [ESS-CHAD].Variables were assessed in univariate and multivariate negative binomial regression models as predictors of moderate/severe OSA on PSG [obstructive apnoea-hypopnoea index (OAHI) > 5 events/hour].
Results: Age, height, weight, weight z-score, BMI, BMI z-score, neck, waist and hip circumferences, neck-to-waist, waist-to-hip and waist-to-height ratios, PSSI-SDB, ESS-CHAD and actigraphic time in bed and fragmentation were associated with OAHI at the univariate level. On multivariable analysis, the PSSI-SDB score predicted moderate/severe OSA either alone (positive likelihood ratio 2.16 and negative likelihood ratio 0.46) or in combination with the actigraphy fragmentation index (positive likelihood ratio 4.09 and negative likelihood ratio 0.23).
Conclusions: This study demonstrates the utility of a tool containing the Sleep Disordered Breathing Subscale of the Pediatric Sleep Survey Instrument and sleep fragmentation quantified using actigraphy in identifying children with DS who have moderate/severe OSA.