Diagnosis of Obstructive Sleep Apnoea in Children: Standards for Sleep Study Duration

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Background:

Obstructive sleep apnoea (OSA) affects 1-6% of children & is linked to respiratory, cognitive & other morbidities. Cardiorespiratory polygraphy (CRPG) & pulse oximetry (PO) aid diagnosis in UK centres. There are no guidelines on minimum recording time for these studies.

Aims:

To inform quality standards for optimal CRPG & PO recording duration.

Methods:

Data were collected from 108 children aged 0.5-18y (60 male) having CRPG with simultaneous PO at Southampton Children’s Hospital. Differences between: apnoea/hypopnoea index (AHI); oximetry desaturation index 4% (ODI4) & Delta 12s index were assessed for the first 4, 5, 6 & 7 hrs of each recording. Clinical thresholds were set at ODI4≥4/hr & AHI≥5/hr.

Results:

Limits of agreement between AHI, ODI4 & Delta 12 index widened with increasing duration of recordings. Median absolute AHI differences increased with time difference (4vs5hr median=0.20, CI=0.15-0.35; 4vs7hr median=0.5, CI=0.39-0.82 [p<0.001]) & predictably, severity (4vs7hr median=0.46 at AHI<5, & 1.20 [p=0.007] at AHI≥5). Median ODI4 absolute differences followed a similar trend, with 4vs5hr median=0.20, CI=0.15-0.30; & 4vs7hr median=0.25, CI=0.21-0.39 (p<0.001); & 4vs7hr median=0.21 at ODI4<4, & 0.82 at ODI4≥4 (p<0.001).

Using 7vs4hr of CRPG, 3 more children (18 vs.15) were identified with AHI≥5 (p=0.453). No more children were identified using ≥4hrs oximetry data with ODI4≥4 (n=12).

Conclusion:

CRPG & PO values differ with longer recording time. Based on 7 vs. 4hrs of CRPG data, 3 extra children would be diagnosed with OSA. CRPG studies of 4hrs duration may underestimate AHI & influence treatment decisions. Minimum standards for duration of recordings should be confirmed in further samples.