Night to night variability of home nocturnal pulse oximetry

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Introduction and Aims

Nocturnal pulse oximetry (NPO) has demonstrated a positive predictive value for identifying obstructive sleep apnoea (OSA) diagnosed by polysomnography (1). Night to night variability of NPO needs further study following encouraging comparisons in children selected for suspected OSA (2). This study aims to confirm whether single-night NPO is sufficient in detecting abnormal oxygen saturation (SpO₂) to reduce wait times and alleviate pressure in an expanding paediatric sleep service.

Methods

This was a retrospective analysis of all baseline 2-night home NPO (01/2014 - 02/2015) with a minimum estimated sleep time of 6hrs; children using ventilators or supplemental oxygen were excluded. Mean and minimum SpO₂ and 4% oxygen desaturation indices (ODIs) were documented. SPSS (Version 22) was used to calculate Descriptive Statistics, perform Spearman’s correlations and Wilcoxon matched pairs tests.

Results

Data were available from 40 children (17 females, median 6.0 years (1.15-17.15 years)). SpO₂ variables correlated well between nights (Figure 1, Table 1), with no significant differences identified by the Wilcoxon matched pairs test (Table 1). 90% (36/40) of first night NPOs agreed with second night NPOs in identifying a 4% ODI of ≥ or ≤ 4 dips/hour.
Table 1: SpO₂ variables from NPO on Nights 1 & 2

<table>
<thead>
<tr>
<th></th>
<th>Night 1 (mean (95% CI))</th>
<th>Night 2 (mean (95% CI))</th>
<th>Spearman’s p</th>
<th>Spearman’s r</th>
<th>Wilcoxon p</th>
<th>Wilcoxon z-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (%)</td>
<td>96.9 (96.4, 97.4)</td>
<td>96.7 (95.8, 97.6)</td>
<td>0.000*</td>
<td>0.657</td>
<td>0.662</td>
<td>-0.437</td>
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<tr>
<td>Nadir (%)</td>
<td>87.5 (85.6, 89.3)</td>
<td>88.4 (86.8, 90.0)</td>
<td>0.000*</td>
<td>0.680</td>
<td>0.384</td>
<td>-0.870</td>
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<tr>
<td>4% ODI (dips/hour)</td>
<td>3.0 (2.1,3.9)</td>
<td>3.1 (1.9,4.2, )</td>
<td>0.000*</td>
<td>0.793</td>
<td>0.957</td>
<td>-0.054</td>
</tr>
</tbody>
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*Significant correlation at the level of <0.01

**Conclusions**

There is excellent agreement within baseline two-night NPO suggesting a single-night is sufficient.

**References**
