CORRESPONDENCE

Effect of CPAP on the metabolic syndrome: a randomised sham-controlled study

A recently published editorial concluded that severity of disease, Continuous Positive Airway Pressure (CPAP) compliance and comorbidities might explain discrepancies between a randomised sham-controlled crossover study which showed that CPAP reversed metabolic syndrome (metS) and reduced weight, body mass index (BMI) and visceral abdominal fat and our findings from a randomised sham-controlled parallel-group study. Whether CPAP might be a novel method to reverse metS in those with Obstructive Sleep Apnea (OSA) is an intriguing possibility, since diagnosing and treating metS is important. We omitted to investigate the effect of CPAP on metS in our population, a typical OSA cohort with treated long-standing metabolic comorbidities and less than ideal CPAP usage. To rectify this, we retrospectively assayed stored blood for lipids and abstracted information regarding hypertension, hyperlipidaemia and its treatment to diagnose metS.

The study design and baseline characteristics have been previously reported. MetS was defined according to international consensus guidelines, and the presence (or absence) of metS was assessed at 0 and 12 weeks. The change in the proportion of participants with or without metS from baseline were analysed by generalised linear models examining the treatment by time interaction (SAS V9.2). Analyses utilised generalised estimating equations and an exchangeable correlation structure, which were then confirmed by Bayesian methods.

Table 1 The development and regression of metS from baseline to week 12

<table>
<thead>
<tr>
<th></th>
<th>CPAP</th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>metS</td>
<td>n MetS</td>
<td>metS</td>
<td>n MetS</td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>18</td>
<td>14</td>
<td>14</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Week 12</td>
<td>metS</td>
<td>12</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n MetS</td>
<td>3</td>
<td>10</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

Data are n metS, metabolic syndrome.

Reversal of metS after 12 weeks occurred in 3 of 18 (17%) men with metS at baseline treated with CPAP compared with 1 of 14 (7%) men treated with sham. MetS resolved in 2 of 14 (14%) men without metS at baseline compared with 3 of 17 (18%) men treated with sham (time by treatment interaction p=0.28): table 1. This indicates that 12 weeks of CPAP therapy had no effect on the development or resolution of metS. It should be noted that previous studies show no effect of CPAP on visceral abdominal fat, BMI and weight, except one: table 2. Our original report and these additional data support the conclusion that CPAP is unlikely to have a major effect on metabolic health in unselected individuals with OSA.

CM Hoyos, DR Sullivan, PY Liu

1Endocrine and Cardiometabolic Research Group, NHMRC Centre for Integrated Research and Understanding of Sleep (CIRUS), Woolcock Institute of Medical Research, University of Sydney, Sydney, New South Wales, Australia
2Biochemistry Department, Royal Prince Alfred Hospital, Sydney, New South Wales, Australia
3Division of Endocrinology, Department of Medicine, David Geffen School of Medicine at UCLA, Harbor-UCLA Medical Center and Los Angeles Biomedical Research Institute, Torrance, California, USA

Correspondence to Dr Peter Y Liu, Division of Endocrinology, Department of Medicine, David Geffen School of Medicine at UCLA, Harbor-UCLA Medical Center and Los Angeles Biomedical Research Institute, 1124 W. Carson Street, Torrance, CA 90502, USA; pliu@labimed.org

Contributors Study concept and design: PYL; Acquisition of data: CMH, DRS; Analysis and interpretation of data: CMH, PYL; Drafting of the manuscript: CMH, PYL; Critical revision of the manuscript: CMH, DRS, PYL; Statistical analysis: CMH PYL; Obtained funding: PYL

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Competing interests None.

Ethics approval The study was approved by the Sydney South West Area Health Service Human Research and Ethics Committee (RPAH Zone).

Provenance and peer review Not commissioned; internally peer reviewed.


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Table 2 Randomised sham-controlled studies examining the effect of CPAP on visceral abdominal fat (VAF)

<table>
<thead>
<tr>
<th>Design</th>
<th>M</th>
<th>F</th>
<th>AHI</th>
<th>BMI</th>
<th>Duration (weeks)</th>
<th>CPAP effect on VAF</th>
<th>CPAP effect on BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel</td>
<td>40</td>
<td>31</td>
<td>12</td>
<td>−0.06 (−0.58 to 0.70) p=0.85</td>
<td>0.07 (−0.11 to 0.26) p=0.79</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.07 (−0.11 to 0.26) p=0.79</td>
<td>−0.06 (−0.1 to −0.01) p&lt;0.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>33</td>
<td>12</td>
<td>−0.20 (−0.37 to −0.06) * p=0.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>31</td>
<td>8</td>
<td>−0.03 (−0.15 to 0.08) p=0.59</td>
<td>0.07 (−0.05 to 0.05) p=0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>27</td>
<td>8</td>
<td>0.14 (−0.09 to 0.37) p=0.25</td>
<td>0.07 (−0.24 to 0.38) p=0.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>30</td>
<td>0.08 (−0.28 to 0.45) p=0.66</td>
<td>0.18 (−0.07 to 0.43) p=0.17</td>
<td></td>
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</tr>
</tbody>
</table>

Data are calculated standardised effect sizes (95% CI) after treatment, unless otherwise stated.

*Values are adjusted for baseline.

M, Male; F, Female; AHI, Apnea Hypopnea Index; BMI, body mass index.
the research team, sleep physicians and technicians at the Woolcock Institute of Medical Research. We also thank the Sleep Disorders Unit and Biochemistry department of the Royal Prince Alfred Hospital.

REFERENCES
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