Mandibular advancement device titration using a remotely controlled mandibular positioner

Omar E. Burschtin MD1, David S. Binder DDS2, Jason Lim BA1, Samantha Malis BS3, Ruth Marsiliani RDH3, Indu Ayappa PhD4, David M. Rapoport MD1

1Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, New York University School of Medicine
2Dental Sleep Apnea NY

Introduction

Mandibular advancement devices are successful in 50% of subjects with obstructive sleep apnea (OSA). Remmers3 used a single night laboratory titration to predict therapeutic outcome using a remotely controlled mandibular positioner (RCMP, SomnoMed MATRxTM, Zephyr Sleep Technologies Inc., Canada).

We report on use of the RCMP in a clinical sleep practice.

Methods

Full night diagnostic polysomnography (PSG-Dx)

AHIA3 = (apneas + hypopneas with either 3% desaturation or EEG arousal)/TST

46 subjects (33M/13F, BMI 26±3.9 kg/m2)

40 with OSA (AHIA3>15/hr)

4 with positional/REM OSA (AHIA3 in supine or REM >15/hr)

2 with snoring + arousal index >20/hr

Mandibular advancement therapy offered if

Diagnostic AHIA3 (AHIA3<30/hr) or

AHIA3<30/hr and refused CPAP (n=16)

Baseline and maximum jaw advancement (ADVmax) determined prior to study by a dentist.

Full night polysomnography with RCMP in place (PSG-RCMP)

During PSG-RCMP, device progressively advanced from baseline to ADVmax until apneas and hypopneas eliminated (ADVopt), or until the patient expressed discomfort.

AHIA3Calc calculated with sleep time limited to period with optimal/maximal advancement.

Success defined (Responders) by

50% reduction if AHIA3max=+20/hr, and AHIA3<15/hr

3 patients with significant response = AHIA3>50% reduction but AHIA3max between 15-25/hr

Results

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<thead>
<tr>
<th></th>
<th>Responders</th>
<th>Non Responders</th>
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<tbody>
<tr>
<td>n</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>AHIA3Dx/hr</td>
<td>35±18</td>
<td>27±18</td>
</tr>
<tr>
<td>AHIA3RCMP/hr</td>
<td>9±17.2</td>
<td>25±13</td>
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54% of subjects showed a therapeutic response

Responders

![Diagram showing AHIA3 and RCMP titration]

Non Responders

![Diagram showing AHIA3 and RCMP titration]

Degree of advancement in Responders

<table>
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<tr>
<th>ADVmax - ADVopt</th>
<th>N</th>
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<tbody>
<tr>
<td>&lt;2 mm</td>
<td>20</td>
</tr>
<tr>
<td>2-5 mm</td>
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Conclusions

The RCMP system was used to advance the dental device over a range of jaw advancements and was well tolerated.

In 20/46 subjects, titration reduced AHIA3 to <15/hr, and 5/46 experienced significant response during the one night titration.

5/25 required 2-5mm less than maximal advancement (ADVmax) recommended by dentist.

Lack of benefit was predicted in 21/46 subjects. The long-term utility of suboptimal advancement, prediction of futility, and sustained efficacy need to be addressed separately.

Acknowledgements

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References