Combination therapy with mandibular advancement and expiratory positive airway pressure valves reduces OSA severity

INTRODUCTION:
CPAP is the first-line treatment for OSA. However, it is often poorly tolerated with adherence rates below 50%. Mandibular advancement splints (MAS) are a viable alternative with higher adherence rates. However, efficacy varies. Approximately 50% have incompletely resolved OSA (AHI>5 events/h) with MAS therapy. Current prediction methods are unreliable. Given that many patients prescribed MAS therapy have also failed CPAP, therapeutic solutions for incomplete MAS responders are needed. Nasal expiratory positive airway pressure (EPAP) valves (e.g. Provent™) can reduce OSA severity and may complement MAS therapy in incomplete responders. However, combination therapy with MAS plus EPAP valves has not been investigated. Thus, this study aimed to determine if combination therapy with a novel MAS device that has a built-in oral airway (O₂VentT™) and oral/nasal EPAP valves reduces OSA severity in incomplete MAS responders.

METHODS:
To date, 13 participants (2 females, 29-65yo, AHI: 9-71 events/h) prescribed an O₂VentT MAS and were incomplete responders (residual AHI>5 events/h), have participated in a split night in-laboratory sleep study. The MAS was worn with the following combinations for each half of the night (order randomised): 1) an oral EPAP valve attached to the MAS's oral airway or 2) a nasal EPAP valve (Provent™) plus an oral EPAP valve.

RESULTS:
MAS alone (advancement 79±14%; mean±SD) reduced the total AHI in these incomplete responders from 30±20 to 22±16 events/h (p=0.01). MAS+oral/nasal EPAP reduced the supine NREM AHI compared to MAS alone (22±20 vs. 13±19 events/h, p<0.05). However, the reduction with MAS+oral EPAP was not different to MAS alone (ΔAHI=-5±16 events/h, p=0.26). With MAS+oral/nasal EPAP vs. MAS alone, total AHI was reduced in n=10. N=6 had either a >50% reduction (n=5) and/or resolution of OSA (n=4).

CONCLUSIONS:
Preliminary findings indicate that combination therapy with the O₂VentT MAS plus oral/nasal EPAP valves reduces OSA severity in incomplete MAS responders. This combined approach may be an effective therapeutic option for a substantial proportion of the OSA patient population in whom MAS therapy alone is only partially efficacious.

SUPPORT:
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Combination therapy with mandibular advancement and expiratory positive airway pressure (EPAP) reduces OSA severity

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Background

- Current challenges in OSA treatment leave many patients who are incompletely treated at risk of adverse health outcomes
- EPAP valves (restricts expiratory airflow to build up upper airway pressure) may complement mandibular advancement splint (MAS) therapy to prevent upper airway collapse
- No studies have explored the efficacy of this simple and potentially beneficial combination therapy

Research Question

Does combination therapy with MAS plus oral ± nasal EPAP reduce OSA severity in incomplete responders to MAS therapy alone?

Methods

Participants

- OSA (baseline AHI > 10 events/hr)
- Recommended by physician for MAS therapy
- Incomplete response to MAS (O2Vent™, Oventus) therapy (residual AHI > 5 events/hr) during 1st split-night PSG

Current study

- 2nd split-night PSG
- Participants wore MAS + an oral EPAP valve for half the night & MAS + oral and nasal EPAP (Provent™) valves for the other half (order randomised).

Analysis

- PSG data scored (2012 AASM criteria) for the following conditions: 1) No MAS, 2) MAS, 3) MAS + oral EPAP valve, 4) MAS + oral and nasal EPAP valves.

Results

1. MAS + oral EPAP reduces OSA severity from no MAS and MAS. Nasal EPAP further reduces OSA severity.

2. Up to ~60% of participants who were incomplete responders to MAS alone had treatment success with combination therapy.

3. Sleep efficiency was reduced with MAS + oral and nasal EPAP.

Conclusions

- Combination therapy with MAS plus EPAP reduces OSA severity to therapeutic levels for a substantial proportion of incomplete responders to MAS therapy
- A caveat was that 23% (5/22) had a substantial reduction in sleep efficacy with MAS plus oro-nasal (but not oral) EPAP
- Future objectives are to assess long term adherence and efficacy and identify predictors to facilitate and tailor treatment for each individual patient

Support

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