

'Good vibrations': positional treatments for obstructive sleep apnoea

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Obstructive sleep apnoea (OSA) is at least twice more severe in the supine position compared with the non-supine positions in about three quarters of patients with OSA.¹ About one-third of them even have 'exclusively positional' sleep apnoea with normal apnoea-hypopnoea index (AHI) in the non-supine positions, which makes them accessible to positional treatment (PT). Until recently, most PT devices were derived from the traditional 'tennis ball technique', which makes the supine position uncomfortable and stimulate patients to sleep on their side. There are plenty of such devices on the market, but they are by essence uncomfortable, and their long-term usage was reported to be very low.²

A new generation of 'active' PT was developed in recent years. It consists of small electronic devices worn either at the neck or at the chest level, which vibrate when the patients are in the supine position until they turn to their side. Several well-designed studies showed encouraging results with a good efficiency in preventing sleep in the supine position and decreasing significantly OSA severity. Usage was shown to be much higher than with the older 'tennis ball technique' devices.³

The well-designed non-inferiority trial study by Yingjuan *et al*⁴ published in this issue of *Thorax* compared a neck-worn 'active' device with autoCPAP. Overall, the results were considered inconclusive since they did not reach the non-inferiority criteria in terms of residual daytime sleepiness (Epworth sleepiness scale), which tended to be higher with PT than with CPAP. Although the AHI and the oxygen desaturation index decreased with both therapies, they were significantly lower with CPAP compared with PT. These results contrast significantly with a recently published study showing non-inferiority of a chest-worn vibrating PT device compared with auto CPAP in terms of residual AHI. In this study, usage time was also about 1 hour longer with PT than with CPAP.⁵

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The reason for the discrepancy between these two studies is unclear but may be due to the type of device used (chest vs neck) since there was persistence of 75 min of sleep 'trunk supine' in the Yingjuan study using a neck worn device. According to Zhu *et al*,⁶ trunk position seems to have a greater impact than head position in the severity of positional sleep apnoea (POSA) especially in obese patients. Another possibility could be the type of population studied. We could for example speculate that some POSA endotypes may better respond to PT than others. PT therapy efficiency could be different in lean or obese patients with POSA, since a large abdomen, pushing the diaphragm upward in the supine position, can decrease the longitudinal tension on the upper airway and thus increase upper airway collapsibility.⁷ In these patients with a large waist-to-hip ratio, PT could have a greater influence on O₂ desaturations and on respiratory events occurring in the supine position than in non-obese patients with POSA (mean body mass index was 26.1 kg/m² in the Yingjuan *et al* study). Further studies should thus explore the demographic and anthropometric differences between PT responders and non-responders in order to better select patients to whom PT should be prescribed.

Apart from these endotypes, another strategy involving 'drug-induced sleep endoscopy' could be used to identify patients with POSA likely to respond to PT. During this procedure, it is possible to assess the impact of turning the head or the whole body to the side on the severity of upper airway obstruction.⁸ Prospective studies should be performed to determine the value of this procedure as a predictor to PT response.

Even if the study by Yingjuan *et al* failed to demonstrate equivalence between CPAP and PT, it showed a significant overall improvement of OSA severity with PT. This should stimulate further development of these 'active' PT devices, which represent an interesting alternative (or an add-on) to classical CPAP or mandibular advancement devices. We can also hope

that, by selecting POSA endotypes likely to be responders to PT, further studies will be able to show even better subjective and objective results in patients with POSA.

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