Treatment options for snoring and sleep apnoea

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Snoring is due to turbulent flow of air through the upper airway, and can arise from transient obstruction at several levels.[1–3] This multi-segmental obstruction occurs in different regions of the pharynx in varying proportions in different individuals. In some patients it is predominantly palatal and nasopharyngeal, whereas in others it may be retroglossal or hypopharyngeal.

Obstruction occurs because of a failure of the upper airway dilator muscles to stabilize the airway during sleep. Their innervation is complex and subject to reflex control. The trauma to the upper airway tissues during snoring and sleep apnoeas damages either muscle fibres or peripheral nerve fibres and this impairs the stabilizing action of the muscles and increases the tendency of the airway to obstruct. The obstruction is compounded by oedema due to the vibration injury during snoring, and these factors, quite independently of the ageing process and obesity, may account for the progression of snoring into sleep apnoeas in some individuals.

Investigative techniques have been developed to predict which patients will benefit from oral appliances or surgery rather than nasal continuous positive air pressure (CPAP), which although effective[4] is often difficult to use properly. Nasopharyngoscopy is performed routinely by otolaryngologists to evaluate the upper airway, both during wakefulness and during sleep. 'Sleep' nasendoscopy[5] allows dynamic examination of the pharynx during drug-induced sedation which simulates sleep. The level at which the airway obstructs can be visualized and site-specific treatment can then be provided. Acoustic analysis of snoring has indicated that frequencies around 20 Hz are associated with palatal fluttering whereas obstruction at other sites gives a more diffuse frequency range. A limitation is the considerable variation in the frequencies from night to night, and the technique cannot be used to predict which individuals have sleep apnoeas rather than simple snoring. Conventional sleep studies are required for this, but developments in software to analyse the snoring duration, loudness, periodicity and frequency may become of clinical value.[6]

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Mandibular advancement devices or splints fit over the anterior teeth like a gum shield and hold the mandible and tongue forwards. Many are thermoplastic and can be moulded by the patient; others are individually constructed, by dental surgeons for instance. Various designs are in use but there are few data to indicate which is most effective.[7] The current indications for these devices are snoring when surgery is not advisable (e.g. when the snoring occurs at the level of the tongue base) and mild to moderate sleep apnoeas, particularly in thin people and those in whom the apnoeas occur predominantly in the supine position. They also have a role in individuals with more severe sleep apnoeas who are intolerant of nasal CPAP treatment. Mandibular advancement devices may affect dental occlusion and the temporomandibular joints.

Surgical treatments can be targeted at different anatomical regions in the upper airway. Nasal surgery such as septoplasty, functional endoscopic sinus surgery and turbinate reduction may be effective if there is nasal obstruction, and nasal abnormalities should be looked for in those who develop nasal symptoms during CPAP treatment. Mandibular, maxillary and hyoid surgery are only occasionally performed and tracheostomy is seldom required, because other treatment options are available. Although palatal surgery has been popular since the 1980s, surgical uvulopalatopharyngoplasty carries a high morbidity which may be avoidable by new laser techniques.[8,9] The short-term results of these are good in selected patients[10] although late recurrence of symptoms has been reported.[11] Radiofrequency thermal ablation with somnoplasty[12] and with the Celon device (Tatla T, Sandhu G, Kotecha B, unpublished) are less painful than a laser palatoplasty and merit further evaluation.

The prevalence of sleep apnoeas in children is around 3%,[13] with the highest frequency between the ages of 2 and 5 years. Hypertrophy of tonsils and adenoids is the commonest cause, but craniofacial abnormalities such as arise in Pierre Robin and Down's syndromes may be responsible. Compliance with nasal CPAP may be difficult to achieve[14] and surgical intervention is effective in carefully selected cases. Craniofacial surgery should be confined to specialist centres.

Although a wide range of treatments is now available for snoring and sleep apnoeas, objective evidence of outcome

benefits is sparse. The impact of snoring and sleep apnoeas on the quality of life of the patient and partner needs to be evaluated and the short and long-term benefits from surgical and non-surgical treatments compared. Newer psychometric techniques are likely to be useful and underline the importance of a multidisciplinary approach to the management of snoring and sleep apnoeas.

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