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Oral appliance therapy for sleep apnoea

KOMMENTAR OG DEBATT

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Oral appliances for sleep apnoea are a well documented and necessary therapeutic option for obstructive sleep apnoea syndrome. At the Center for Sleep Disorders, Haukeland University Hospital, a specialist dental clinic has been established as part of the multidisciplinary team.

One of the most common types of oral appliances used in the treatment of sleep apnoea. Photo: private

Sleep apnoea entails repeated cessation of breathing during sleep. This is usually due to obstruction of the upper airways; it is then termed obstructive apnoea. A Norwegian study indicates that 16 % of people aged 30 – 65 have this condition (1). Snoring is a common symptom of obstructive apnoea, but not all those who snore have the illness. Snoring is common, with a prevalence in Norway of 20 % for adult women and 33 % for men (1).

When snoring occurs without cessation of breathing, we refer to it as social snoring. Persons with sleep apnoea, on the other hand, often report pronounced daytime symptoms. The condition is then termed obstructive sleep apnoea syndrome. Snoring alone without cessation of breathing generally gives rise to few symptoms, but may result in reduced sleep quality for both the snorer and his/her partner.

Consequences

Apart from cessation of breathing and daytime tiredness, obstructive sleep apnoea syndrome is also associated with other symptoms and comorbidities such as night-time waking, gasping for air, reduced ability to concentrate,

reduced reaction time, hypertension and other cardiovascular diseases, in addition to metabolic illnesses, asthma and depression. Shortened life expectancy is reported for this patient group (2).

The medical and social consequences may be significant, and early diagnosis is therefore important. To make the diagnosis, objective measurements must be performed in addition to subjective measurements based on a thorough anamnesis. Polysomnography is the «gold standard», but is a resource-intensive procedure. Where there is a high pre-test probability of obstructive sleep apnoea syndrome, respiratory polygraphy is a well-validated method (3), and the degree of severity is assessed according to the number of cessations in breathing per hour – apnoea-hypopnoea index (AHI): mild: 5 – 14, moderate: 15 – 29, severe: ≥ 30. In addition, the degree of daytime sleepiness and oxygen saturation level through the night are assessed.

Oral appliance as an option

In the specialist health service three main forms of therapy for sleep apnoea have been used. These are soft tissue surgery of the soft palate/pharynx, application of positive airway pressure via a face mask (CPAP) and an oral appliance for sleep apnoea.

Surgery was previously the most common form of treatment for snoring and mild to moderate obstructive sleep apnoea in the specialist health service (4). The report on treatment practice in the Nordic countries from 2007 shows that Norway came far below Sweden with regard to treatment using oral appliances, and far higher than Sweden with regard to use of surgery (3). However, long-term follow-up of surgical treatment has revealed less than satisfactory results (3, 4), and surgery is now reserved for children with tonsil hypertrophy and a smaller category of adults following a thorough assessment of the level of obstruction.

CPAP treatment is now considered the «gold standard» for obstructive sleep apnoea (3). However, a relatively large percentage of patients find it difficult to use (5), and where there is poor compliance, oral appliances may be an effective alternative. In mild to moderate obstructive sleep apnoea syndrome, oral appliances demonstrate an efficacy along subjective and objective parameters that is in line with CPAP (6, 7). The hypertension-lowering effect is comparable to CPAP treatment (8), and cardiovascular mortality is the same for both treatment methods (9). There is speculation as to whether the health effects of oral appliances for sleep apnoea versus CPAP are comparable because treatment with oral appliances has better long-term compliance. Three of four patients are still using the oral appliance after one year, whereas approximately half are still using CPAP (5). However, we should point out that compliance with the oral appliance, unlike CPAP, is usually self-reported, which may result in some erroneous information. Our clinical experience indicates that the oral appliance has a positive effect along both subjective and objective sleep parameters, especially in mild to moderate sleep apnoea, but also sometimes in the severe form, which is supported by recent studies (7, 10).

The indications for oral appliance therapy for sleep apnoea have been extended in recent years, and besides snoring, they also encompass other subgroups of obstructive sleep apnoea. International associations for sleep medicine in the USA, Australia and Canada have provided recommendations for the use of oral appliances, summarised in Table 1. No corresponding Norwegian guidelines exist.

Table 1

Indications for oral appliance for sleep apnoea, according to recommendations by international associations for sleep medicine

Indications	Comments
Snoring	Effective, but there are no definitive data on the health efficacy of treatment for snoring
Mild to moderate sleep apnoea	«Non-compliant» for CPAP and other alternative therapies such as weight reduction/positional therapy Wants oral appliance rather than CPAP
Severe sleep apnoea	CPAP therapy must have been tried because the efficacy of this treatment is considered to be better

From external collaboration to full integration

Oral appliance therapy for sleep apnoea has become a more common form of treatment in Norway. Nevertheless, our impression is that there are significant differences in practice between the Nordic countries, which may be attributed to different levels of knowledge about this form of treatment within dentistry and medicine. Differences in rules for reimbursement may also have an impact on therapeutic practice. In Norway, oral appliances for sleep apnoea fall within the category of therapeutic aids whose costs the health enterprises are responsible for covering pursuant to section 2 – 1a of the Specialist Health Service Act. In Sweden, oral appliance therapy has been covered via the government dental care support /dental care scheme which came into force in 1999.

For many years, dental specialists in Bergen have treated sleep apnoea patients with oral appliances in collaboration with Haukeland University Hospital. On this basis, a collaboration has also been developed between the Department of Thoracic Medicine at Haukeland University Hospital and the dental research community at the University of Bergen. Since the Center for Sleep Disorders came to fruition in March 2011, Bergen Hospital Trust, through the Department of Thoracic Medicine as the administrative body, has developed this into a multidisciplinary centre which comprises doctors, nurses and mercantile personnel from the Department of Otolaryngology, Department of Thoracic Medicine, Department of Neurology, Department of Clinical Neurophysiology, Department of Psychiatry, and in the past year also dentists. A dental surgery with the necessary equipment was in place on 1 February

2013. From 2014, following one year of project use, this has become a permanent treatment service with senior consultant dental surgeons employed as part of the therapeutic team. A permanent position is shared among three dentists with a background in research, and further research will increase the knowledge base for oral appliance therapy for sleep apnoea.

The dentists at the Center for Sleep Disorders deliver custom-made oral appliances for patients who have tried CPAP for at least three months and who show poor compliance, defined as average use of < 5 hours per night. The dentist takes impressions of the teeth and bite registrations, and fabricates adjustable oral appliances individually moulded for each patient's jaw. When the patient and dentist are satisfied with the functioning of the appliance, a new respiratory polygraphy is performed as an objective measurement of the appliance's efficacy. Its position is then adjusted to achieve optimum effect. The patient's subjective perception of the appliance is registered using a questionnaire and through dialogue. If satisfactory objective and subjective results are not achieved after several adjustments, it may be relevant to change to another type of appliance or consider an alternative treatment. A quality assurance/follow-up of patients who have been given oral appliances for moderate and severe sleep apnoea since 2007 is ongoing.

The way forward?

We believe that the volume of patients with obstructive sleep apnoea who are treated with oral appliances will increase in the future. In March 2014, there were 52 patients on the waiting list for oral appliance therapy at Haukeland University Hospital. Oral appliance therapy for mild to moderate sleep apnoea is well documented, but in severe sleep apnoea, much research on therapeutic efficacy is still needed. Multidisciplinary teamwork is important for diagnosis, treatment and follow-up. Oral appliance therapy is covered by the health enterprises, but health enterprises in Norway are now choosing different organisational models – most involving private-sector tenders. The challenge is to ensure good professional teamwork and follow-up of this patient group.

We recommend our model for the following reasons: treatment with oral appliances is carried out by experienced dentists specialised in dental sleep medicine, and standardised patient pathways for diagnostics and check-up programmes are more easily established and quality-assured in enterprises where all the actors are part of the same entity. Furthermore, logistical challenges are avoided with regard to referrals and re-referrals, as well as with regard to agreement structures and invoicing between actors within and outside of hospitals; all documentation is gathered in one place. Competence enhancement for dentists and other healthcare workers in the team is simplified by sharing a physical location, and this promotes and facilitates interdisciplinary research activities.

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