EFFECTIVENESS AND SIDE-EFFECTS OF NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE THERAPY IN 66 PATIENTS WITH SLEEP APNEA

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INTRODUCTION

Since upper airway obstruction has been recognized as the crucial factor in the development of obstructive sleep apnea, tracheostomy - first reported as a therapeutical measure by Kuhlo et al. in 1969 - is regarded as the therapy of choice in patients with sleep apnea. The recognition of severe social and medical complications as long-term consequences of tracheostomy paved the ground for an intensive search for alternative methods during the years which followed. Therapeutical success could be achieved with certain medications and with pharyngeal dilatation by way of surgery, but neither of these methods was as successful as tracheostomy (Cohn, 1986; Strohl et al., 1981).

In 1981, Sullivan and colleagues first reported instances of successful therapy of obstructive sleep apnea by means of nasal continuous positive airway pressure (nCPAP) (Sullivan et al., 1981). This form of therapy was then employed successfully in various medical centers (Krieger et al., 1984; Remmers et al., 1984; Becker et al., 1988 in the press). Reports on the efficiency of long-term treatment, however, vary to a sometimes marked degree from center to center (Issa et al., 1987; Schweitzer et al., 1987).

In our hospital, patients with sleep apnea have for some time been treated according to a prechosen standardized therapeutical scheme, including the acquisition of relevant data regarding the effectiveness and the side effects of nCPAP therapy.

METHODS

We studied 66 male patients with an established result of sleep apnea. Their mean age was 52.8 years (34-75 years), and their mean bodyweight 125.7 (84-188) in percent of normal weight. Their initial result of sleep apnea averaged 46.5 (12-113) episodes/h, and the duration of the longest apnea episode per patient averaged 65.4 s (12-180 s). One patient had central sleep apnea, while 65 suffered from the obstructive or mixed type of sleep apnea.
Before onset of therapy, we conducted extensive internal examinations including ECG at rest and during exercise, chest X-ray, echocardiography, lung function test, blood gas analysis, and comprehensive laboratory findings as well as ENT-status and neurological examinations.

After one night of polysomnographic recordings we conducted three nights of nCPAP therapy under conditions of intensive care, as individual cases of critically prolonged nocturnal hypoxemia during the initial phase of nCPAP treatment have been reported in the literature (Krieger et al., 1983). The recordings included thoracic and abdominal respiration (inductive plethysmography), nasal airflow, partial arterial oxygen tension or saturation, nCPAP values, and an ECG.

Those patients who continued treatment after this initial phase were asked to report side-effects of nCPAP therapy after a minimum of one month of treatment. Information on complaints was collected by means of a questionnaire. Throughout the time of treatment, which was 1-17 months in the present case, the patients contacted the attending physician in our outpatient department at regular intervals.

RESULTS

The Effect of nCPAP Treatment on Sleep Apnea.

After three nights of treatment, a 90-100% reduction of apnea could be achieved in 62 patients, and a 75% reduction in one. The average apnea index decreased from 46.5 to 1.6 episodes/h. The remaining apneas were predominantly of the central type, and the longest apnea episodes were distinctly shorter than before treatment (17.6 s on average, as compared with 65.4 s before). Figure 1 illustrates the effect of nCPAP on respiration during sleep. One patient suffered from acute rhinitis, and another from claustrophobia. In both cases, therapy had to be interrupted after two days. An airway pressure of 15 mbar, the maximum available with the device we used, proved insufficient in one patient with chelognathopalatoschisis, previously operated upon. In the remaining 63 patients, the effective nCPAP pressure values as determined during the adjustment phase were between 5 and 15 mbar. Figure 2 shows the distribution of effective nCPAP values.

Long-term nCPAP Treatment and Side-effects.

Out of 63 patients who could be effectively treated by means of nCPAP, 60 decided to continue therapy in their homes. The patients were