„Evidence of the efficacy of the SNX Mandibular Advancement Device“

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1. The Problem

Mandibular Advancement Devices are now being used increasingly in Germany to treat obstructive snoring and obstructive sleep apnoea. A wide variety of studies have shown to be effective (Kushida et al. 2006, Peter et al. 2007) though models vary. However, 2 disadvantages have become apparent in the use of these devices so far. One is that the existing models are relatively large and can be unpleasant to wear as a result. The other is that the current models mostly are very inflexible and therefore do not permit such actions as adequate swallowing movements and speaking. These and other problems with existing models led to the development of the SNX device examined here. This newly developed oral device protrudes the lower jaw. In the present study we aim to clarify whether it is able to reduce snoring and improve apnoea-hypopnoea and oxygen saturation.

2. Method

2.1 Sample:
The study is based on the evaluations of 67 patients from the years 2012 to 2017. The participants complained about snoring with or without nocturnal breathing breaks. Of these people, 14 were women and 53 were men between the ages of 25 and 79, with an average of 53.98 years. The body mass index (BMI) averaged 27.67.

2.2 Design / Mesurement method:
Prior to treatment, cardio respiratory polygraphy (KRPG) was used to measure the severity of the condition. This was followed by the adaptation of the SNX device and a new measurement using KRPG. The data were appraised by a somnologist and the apnoea-hypopnoea index (AHI) oxygen desaturation index (ODI) and percentage of snoring in the total evaluation time were then calculated.

2.3 Statistics:
The normal descriptive statistics, such as mean, standard deviation etc. et al were calculated and the following non-parametric and parametric tests were used: the Wilcoxon test, the paired-sample T-test and the Spearman correlation.

3. Results

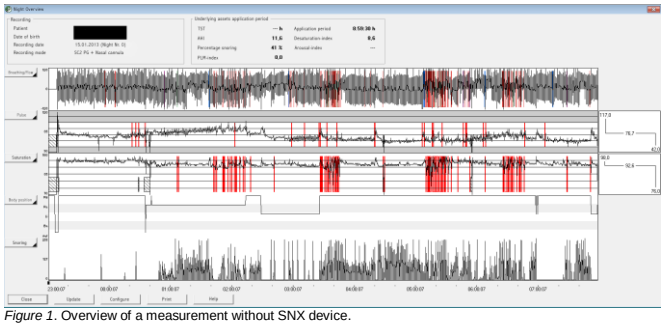

Figure 1. Overview of a measurement without SNX device.

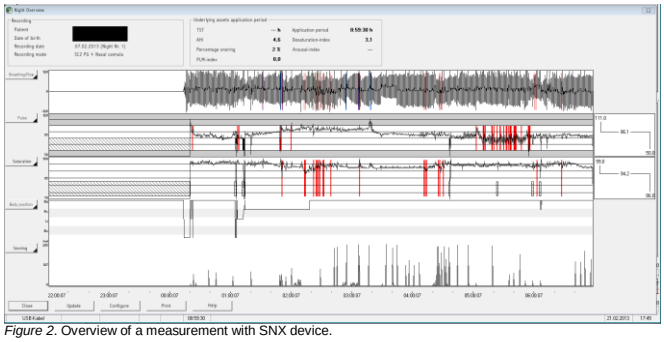

Figure 2. Overview of a measurement with SNX device.

As an example of how to test the effectiveness of the SNX device Figure 1 shows the results of a manually validated KRPG without using the SNX device (DD) and Figure 2 shows the KRPG measurement with SNX device (SNX). There is clearly a reduction of the breathing pauses, the desaturations and snoring to detect.
Overall, it can be stated that the use of the SNX device both the proportion of snoring (on average from 19.8% to 10.4%), the AHI (average of 23.97 to 7.40) and the Significantly improved from 15.40 to 4.57 (see Figure 3).
Thus, the Wilcoxon test showed a significant improvement in all three cases with significances of p = .000 to p = 0.001. The t-test in paired samples also showed a significant improvement with p = .000 to p = .001.

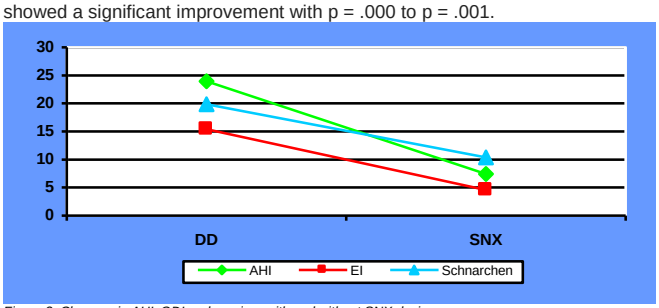

Figure 3. Changes in AHI, ODI and snoring, with and without SNX device.

The mean protrusion was 6.54 mm. In addition, there was a highly significant correlation between the BMI and the AHI (r = 0.512 (p <0.01)), as well as the EI (r = 0.510 (p <0.01)) and the proportion of snoring (r = 0.513, p <0.01).

4. Discussion

These results confirm that the SNX device is able to improve both obstructive snoring and obstructive sleep apnoea. Furthermore they show, that more obese patients snore more, than less adipose patients, which should be investigated more closely in the main study, In case of a confirmed connexion between the weight of the patient a more intense protrusion would have to be made in the first place, as well as the urgent recommendation for weight reduction. Since the degree of the protrusion used initially was the final customisation, it can be stated that after the final optimisation, the therapy by means of SNX device can be considered highly effective in the treatment of sleep apnoea syndrome.

Literature:

Kushida CA, Morgenthaler TI, Littner MR et al (2006) *Practice parameters for the treatment of snoring and Obstructive Sleep Apnoea with oral appliances: an update for 2005.* Sleep 29:240-243.

Peter H, Penzel T, Peter JH (2007) *Enzyklopädie der Schlafmedizin.* Springer, Berlin Heidelberg New York Tokio.

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