

Functional treatment of Sleep Disordered Breathing with the Tongue Right Positioner appliance: Effects on AHI and SpO2

Dr P. Wulleman^a, Dr A. Belattar^b, Dr A. Inoshita^c, Dr H. Suzuki^d, Dr C. Mauclaire^e, Dr B. Winter^f

^a SleepClinic.be, Bruxelles, Belgium, ^b Clinique hôpital de la Roseraie, Aubervilliers, France, ^c Juntendo University School of Medicine, Tokyo, Japan, ^d Nihon University School of Dentistry at Matsudo, Chiba, Japan, ^e Clinique d'orthodontie, Troyes France, ^f Airway.no, Oslo, Norway

Introduction

Oro-myofunctional retraining has been shown to be effective in the treatment of Obstructive Sleep Apnea Syndrome (OSAS)^{1,2}. The Tongue Right Positioner (TRP) appliance worn during sleep could be seen as a novel treatment for patients with obstructive sleep apnea (OSA). Its neuro-myofunctional and proprioceptive mechanism of action has a direct influence on position, motor skills and mobility of the tongue and adjacent pharyngeal structures, thereby opening the airway and stimulating nasal breathing.

Study subjects

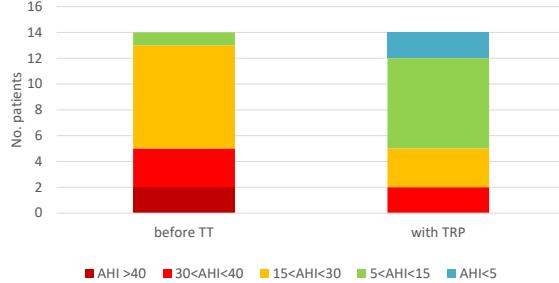
Number and gender	7 ♀ - 7 ♂
Caucasians / Asians	11 / 3
Age (years)	52,8 ±13,4
BMI (kg/m ²)	24,3 ±3,2

Results

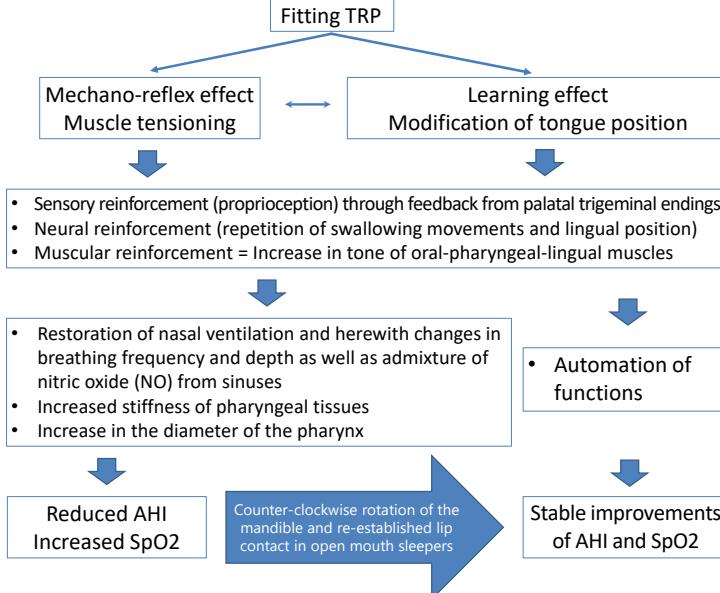
SpO₂ evolution with TRP treatment



Evolution of OSA severity with TRP



Discussion



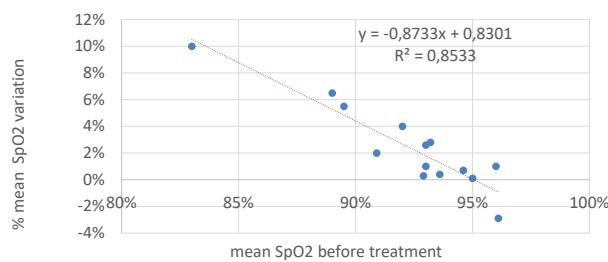
The TRP (Tongue Right Positioner)



- Removable, custom-made oral device
- Permanent stimulation of the tongue³ to establish physiological functions and rest positions
- Promotes increased nasal patency⁴
- Discreet, comfortable, good tolerance, compliance > 95%
- No iatrogenic effects

Initial avg. AHI	29.1 ±13.4
No. patients with AHI >40/ >30/ >15/ >10/ <10	2 / 3 / 8 / 1 / 0
Mean SpO2	92.3 ±3.4%
Avg. duration between measurement (months)	9.6 ±5.4

% mean SpO₂ variation / initial level



Distribution of patients after treatment with TRP

Avg. final AHI : 15.3 ±11.1 Avg. final m. SpO2 : 94.7 ±1.3%
Avg. AHI reduction : 47.5 ±32% Avg. variation m. SpO2: 2.4 ±3.2%
% patients AHI ≤ 15/h : 64% % patients m. SpO2 ≥ 95%: 57%

Correlations	r	P-value
AHI variation / AHI final	-0.77	<0.01
Mean SpO2 variation / mean SpO2 initial	-0.92	<0.001
Mean SpO2 variation / AHI variation	-0.42	NS
Mean SpO2 final / AHI final	-0.30	NS

Conclusion

Strong anticorrelation between mean SpO₂ level before treatment and increase in mean SpO₂ ($r = -0.92$; p -value <0.001), despite heterogeneity of study subjects. This result suggests that the effect of TRP is inversely proportional to patients initial SpO₂ level.

No correlation between AHI and mean SpO₂ variations could be established.

This suggests that mean SpO₂ increase is related to nasal breathing restoration and related benefits of longer and deeper ventilation cycles as well as vasodilating effect of Nitric Oxide released by the nose⁵, thus optimizing O₂/CO₂ exchange in lungs alveola.

AHI and mean SpO₂ improvement could be explained by higher tongue tone and strengthening of pharyngeal tissues.

No occlusal or periodontal adverse effect caused by TRP was reported.

These data indicate that nightly use of TRP appliance is capable of reducing OSA symptoms as well as improving oxygen saturation.

References

- Guimaraes et al (2009) Am J Respir Crit Care Med 179:962-966
- Rousseau et al (2015) Can Respir J 22:176-8
- Mauclaire et al (2015) Int Orthod 13:370-89
- Mauclaire et al (2016) Médecine du Sommeil 13:34
- Lundberg J. (2008) Anat Rec. 291:1479-1484

Conflicts of Interest

- Authors a, b and f are clinical advisors or shareholders of Tongue Lab, maker of the TRP and have not received compensation by this company
- Author e is the inventor of the TRP device