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**Title:** Myofunctional treatment of sleep disordered breathing in children

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**Body:** Introduction: Notwithstanding adenotonsillar hypertrophy is the main causative factor of pediatric obstructive sleep apnea (OSA), a residual OSA after adenotonsillectomy (AT) is often reported and we hypothesise that oropharyngeal hypotonia is implicated in the pathogenesis of OSA and oropharyngeal exercises (myofunctional therapy) may improve stomatognathics functions and reduce neuromuscular impairment. Aim: To evaluate efficacy of myofunctional treatment in children with residual OSA. Methods: Polysomnographic recordings have been performed before the surgical therapy (T0) and 6 months after AT (T1). Thereafter, patients with a residual OSA (apnea hypopnea index, AHI>1) have been randomized in a group treated with myofunctional therapy (group 1) and a control group (group 2). A morphofunctional evaluation with Glatzel and Rosenthal tests were performed before (T1) and after 3 months of exercises (T2). All subjects were reevaluated at T2. The improvement of OSA was defined by  $\Delta\text{AHI} = (\text{AHI at T1} - \text{AHI at T2}) / \text{AHI at T1} * 100$ . Result Group 1 was composed by 12 subjects (males 10; mean age  $5.37 \pm 1.71$ ) and Group 2 was composed by 9 subjects (males 8; mean age  $4.25 \pm 0.39$ ). The AHI was  $16.31 \pm 9.51$  in T0 and  $3.46 \pm 2.32$  in T1 ( $p < 0.0001$ ). The  $\Delta\text{AHI}$  was significantly higher ( $p < 0.05$ ) in group 1 ( $52.64\% \pm 29.39\%$ ) respectively group 2 ( $1.01\% \pm 56.35\%$ ). Myofunctional evaluation demonstrated: reduction of oral breathing (12/12 vs 3/12,  $p < 0.0001$ ), positive Glatzel test (9/12 vs 3/12,  $p < 0.05$ ), positive Rosenthal test (9/12 vs 3/12,  $p < 0.05$ ) and increase lip competence (1/12 vs 10/12,  $p < 0.0001$ ),. Conclusion Myofunctional therapy could be an efficacious treatment in pediatric OSA in addition to AT.