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Inspiratory ventilatory training in patients with repaired tetralogy of Fallot

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Objectives: Tetralogy of Fallot (TOF), a right heart obstructive congenital heart disease (CHD) affects the pulmonary system. The undersupply in the lungs may lead to lower exercise capacity and impaired lung volumes. Training of deep inhalation may train the lung volumes, improve pulmonary blood flow and lead to a better exercise capacity and lung function. This study examines the effects of a volume-oriented inspiratory ventilatory training in patients with repaired TOF on exercise capacity and lung volumes.

Methods: From February 2017 to November 2018 fifty-four patients (age at inclusion: 14.7 ± 4.8 , 39% female) completed a ventilatory training. All of them had a TOF or a similar CHD. They underwent a spirometry (forced vital capacity, FVC; forced expiratory volume within the first second, FEV1) and a cardiopulmonary exercise test (CPET: peak oxygen uptake, VO_{2peak}). Data were compared to references and expressed as %predicted (mean \pm SD). Statistical analyses were done via Student's t-Test for dependent samples. Patients were re-examined six month after their training.

Results: While VO_{2peak} did not significantly increase after the training, lung function improved (FVC: 83.6 ± 2.2 vs. 86.1 ± 2.4 %predicted, $p=0.004$; FEV1: 82.5 ± 2.2 vs. 82.5 ± 84.8 %predicted, $p=0.017$). FEV1 to FVC ratio did not change significantly.

Conclusions: This study shows that patients with repaired TOF benefit from a volume-oriented inspiratory breathing training with regard to their spirometry results. Exercise capacity did not show any improvement.