

## MP3-6

### **Supervised exercise training improves exercise capacity and chronotropic competence in children and adolescents with pulmonary arterial hypertension**

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**BACKGROUND:** Pulmonary arterial hypertension (PAH) is often associated with impaired exercise capacity and cardiac autonomic dysfunction. It has been shown that supervised training can improve exercise capacity in adult patients with PAH, which is usually associated with an improved peak oxygen uptake. So far, there is only limited experience of supervised exercise training in the pediatric age group. The objective of this prospective study was to assess the feasibility and efficacy of an exercise training program in children and adolescents with PAH.

**PATIENTS AND METHODS:** Nine children with moderate PAH (six female, mean age  $15.2 \pm 3.8$  years; mean pulmonary to systemic arterial pressure ratio  $0.51 \pm 0.19$ ) performed homebased supervised exercise training (ergometer and theraband) for 16 weeks. Cardiopulmonary exercise testing and health-related quality of life was evaluated before and after 16 weeks of training. PAH-specific targeted medication remained unchanged during the study period.

**RESULTS:** Exercise training was well tolerated in all patients. After 16 weeks of supervised training, patients significantly improved their exercise capacity (treadmill running distance increased from  $589.5 \pm 153.9$  to  $747.9 \pm 209.2$  meters ( $p=0.036$ )). Peak oxygen uptake remained unchanged. Chronotropic index, a parameter that defines chronotropic response independently of age, resting heart rate, and functional state, improved from  $0.77 \pm 0.12$  to  $0.82 \pm 0.11$  ( $p=0.004$ ), while the increase in chronotropic index was related to the increase in running distance ( $r=0.62$ ;  $p=0.07$ ).

**CONCLUSIONS:** According to our experience, supervised exercise training is effective in children and adolescents with moderate PAH. The observed increase in exercise capacity was accomplished by an improved chronotropic competence rather than an increase in peak oxygen uptake as in the adult population. Therefore, chronotropic competence may serve as a physiologically important therapeutic target specifically for training programs in children and adolescents with PAH alongside the usual measurements of oxygen consumption. The prognostic impact of chronotropic competence needs to be assessed in future studies.