Exercise induced inspiratory stridor (EIS) is increasingly recognized as a complex of symptoms frequently occurring during physical activity in young people. EIS is often diagnosed and treated as exercise-induced asthma, with diminutive clinical effect. EIS has been attributed to inappropriate adduction of the vocal cords (VCD), often without verification by laryngoscopy.

**PURPOSE:** To describe laryngeal findings from continuous video-recorded laryngoscopy performed during maximal cardiopulmonary exercise (CLE-test) in a population referred for inspiratory stridor and/or breathing difficulties to our center in 2012-2013.

**METHODS:** The CLE-test was performed in 166 new referrals, 140 with complete video recordings and clinical data, of which 108 were normal active subjects. Laryngeal adduction was graded (grade 0-3) glottic and supraglottic (grade 0-1 considered normal), and the configuration of the epiglottis was registered.

**RESULTS:** Of the tested individuals, 70 (65%) were female, mean age (SD) was 17.6 (8.6) years. Primary VCD was rare, observed in 15 (14%). Inappropriate adduction of supraglottic structures was the primary obstructing event in 50 (46%), with secondary adduction of vocal cords in 25 (50%). The adduction of supraglottic folds caused respiratory distress by severely impeding the laryngeal inlet in 16 (15%). Abnormalities of the epiglottis were registered in 21 (19%), primary laryngomalacia in 4 (4%), whereas 43 (40%) had normal laryngeal findings. No adverse effects were noted. Eighty-six (80%) had previously used asthma medication of whom 56 (65%) had stopped, while 30 (28%) used it currently. Non-organized exercise was performed by 39 (36%), organized by 49 (45%) and medium level competitive exercise by 20 (19%), with no gender differences (p=0.148). Mean VO2 (ml/kg/min) (SD) was 49.1 (11.6) in males and 43.2 (7.9) in females, and for both genders increasing with level of exercise (p=0.002) and numbers of hours of exercise per week (p=0.001).

**CONCLUSIONS:** The study suggests that primary adduction of the supraglottic structures was the inciting event in most non-athletes presenting with EIS, whereas primary VCD was rare. EIS should not be linked to VCD without verification by laryngoscopy. The CLE-test has been performed successfully in a large population without adverse effects.

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**Cardiopulmonary Exercise Test (CPET) and Six-minute walk test (6MWT) are important tools in the evaluation and follow up of patients with Idiopathic Pulmonary Arterial Hypertension (IPAH).**

**PURPOSE:** To determine if the simple Six-minute walk test (6MWT) is a valid predictor of VO2 peak in patients with IPAH.

**METHODS:** 157 patients being treated for IPAH from 2003 to 2013 were included in this study. A 6MWT and a Cardiopulmonary Exercise Test (CPET) were performed as part of routine care. The 6MWT was conducted in accordance with American Thoracic Society (ATS) standards, using a 30m hallway. Heart rate (HR), pulse oximetry (SpO2) via finger probe and Borg’s rate of perceived exertion (RPE) were measured at baseline and post-test. The CPET was performed on a cycle ergometer using a ramp protocol. Electrocardiogram (EKG), analysis of expired air, SpO2, and blood pressure (BP) were monitored throughout the CPET. Subjects were stratified post-hoc by age (26 children<12 mean age 9.96±1.66, 73% female 27% male ; 49 adolescents=13-18 mean age 15.33±1.86, 47% female 53% male; 82 adults=>19 mean age 27.33±6.70, 69.5% female 30.5% male), for between-group comparison of anthropometric and 6MWT variables. Multiple linear regression analysis was performed to predict VO2 peak for each of the groups from the 6MWT.

**RESULTS:** The regression equation generated for the children group (VO2 peak= 38.853 + 4.847xGender - 0.073xHeight - 0.293xWeight +15.022xSpeed (m/s) - 1.153xDyspnea (Borg 1-10)-0.175xResting HR) was the only model to significantly predict VO2 peak (r2=0.80, p=0.804). Similar models for the adolescent and adult groups did not achieve statistical significance (r2=0.39, p=0.142 and r2=0.38, p=0.025, respectively).

**CONCLUSION:** The measured VO2 peak of the patient population varied greatly by age. A 6MWT was able to accurately predict VO2 peak in children (6-12 years) with IPAH, however the model failed to predict VO2 peak in older populations. These findings suggest that CPET measured VO2 peak is the only reliable method for the evaluation of all patients with IPAH.

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**Predicting VO2 peak from Six Minute Walk Test in Patients with Pulmonary Hypertension**

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**PURPOSE:** To determine if the simple Six-minute walk test (6MWT) is a valid predictor of VO2 peak in patients with IPAH.

**METHODS:** 157 patients being treated for IPAH from 2003 to 2013 were included in this study. A 6MWT and a Cardiopulmonary Exercise Test (CPET) were performed as part of routine care. The 6MWT was conducted in accordance with American Thoracic Society (ATS) standards, using a 30m hallway. Heart rate (HR), pulse oximetry (SpO2) via finger probe and Borg’s rate of perceived exertion (RPE) were measured at baseline and post-test. The CPET was performed on a cycle ergometer using a ramp protocol. Electrocardiogram (EKG), analysis of expired air, SpO2, and blood pressure (BP) were monitored throughout the CPET. Subjects were stratified post-hoc by age (26 children<12 mean age 9.96±1.66, 73% female 27% male ; 49 adolescents=13-18 mean age 15.33±1.86, 47% female 53% male; 82 adults=>19 mean age 27.33±6.70, 69.5% female 30.5% male), for between-group comparison of anthropometric and 6MWT variables. Multiple linear regression analysis was performed to predict VO2 peak for each of the groups from the 6MWT.

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**CONCLUSION:** The measured VO2 peak of the patient population varied greatly by age. A 6MWT was able to accurately predict VO2 peak in children (6-12 years) with IPAH, however the model failed to predict VO2 peak in older populations. These findings suggest that CPET measured VO2 peak is the only reliable method for the evaluation of all patients with IPAH.

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**Effects of Physical Training on Pulmonary Function of Overweight Adolescents with Exercise-Induced Bronchoconstriction**

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**PURPOSE:** To assess the effects of physical training on pulmonary function of overweight adolescents with exercise-induced bronchoconstriction (EIB).

**METHODS:** Out of 31 adolescents (age = 12 ± 0.6 yrs) who took part in the study, 12 were allocated in the EIB+exercise group (EIB+E), body mass index (BMI) = 30 ± 4.6, 10 in the exercise group (E), BMI = 27 ± 3.9 and 9 in the control group (C) (BMI = 27 ± 4.5). Basal pulmonary function was measured while sitting in a Chair: and the variables measured were: forced expiratory volume in one second (FEV1), forced vital capacity (FVC), Tiffeneau index (%FEV1/FVC, peak expiratory flow (PEF), and forced expiratory flow between 25 and 75% of vital capacity (FEF25-75%). EIB was determined by a treadmill test consisting of 8 min at 85% of maximal heart rate and a grade of 10%. EIB was considered when a drop ≥10% in FEV1, from the basal value was observed after (5, 10, 15, and 30 min) exercise. The area under the curve was also calculated (AUC0-300s). The physical training consisted of supervised swimming, aerobics, walking and cycling, three times a week for 12 weeks as suggested by ACSM guidelines. For statistical comparisons, appropriate analysis of variance were used.

**RESULTS:** As expected the EIB+E group showed the lowest FEV1 (% predict) (EIB+E = 90%; E = 100%; C = 93%), Tiffeneau index (EIB+E = 83%; E = 91%; C = 87%), PEF (% predict) (EIB+E = 73%; E = 86%; C = 69%), FEF25-75% (% predict) (EIB+E = 76%; E = 107%; C = 90%) and AUC0-300s (EIB+E = 78%; E = 92%; C = 71%) and drop in FEV1 (EIB+E = 3%; E = 2%; C = 5%) was significantly lower at baseline compared to post-exercise training. After the 12 weeks there was an improvement for the children group in the FEV1 (EIB+E = 3%; E = 2%; C = 1%) and AUC0-300s (EIB+E = 6%; E = 2%; C = 2%) and % drop in FEV1 (% predict) (EIB+E = 3%; E = 5%; C = 8%). The physical training had positive effects on pulmonary function and reduced the EIB intensity in overweight adolescents.

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**Inhaled Ipratropium Bromide Prevents Exercise-Induced Bronchoconstriction in Endurance Athletes**