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Title: Lung clearance index and exercise capacity among children with bronchiectasis

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Body: Background: In paediatric bronchiectasis, there has been limited experience on the relationship between disease severity, as assessed by exercise limitation and lung clearance index (LCI). Aim: To compare LCI and exercise capacity among children with bronchiectasis. Method: Fifteen stable children and adolescents with CF, 14 stable children with non-CF bronchiectasis and 15 healthy children and adolescents, participated in maximal incremental cardiopulmonary exercise testing using a cycle ergometer and they had an LCI assessment. Results: The CF children's mean age was 13.7 years, mean FEV₁ 74.4% predicted. The 14 non-CF bronchiectasis children's mean age was 13.8 years, mean FEV₁ 75.1% predicted and the healthy children's mean age was 13.6 years, mean FEV₁ 94.7%. Among CF patients there was evidence of exercise limitation, with mean Peak Aerobic Capacity (V'Opeak) 62.2 % predicted. Among the non-CF bronchiectasis patients there was evidence of exercise limitation, with mean V'Opeak 77.3 % predicted. Mean V'Opeak did not differ significantly among children with CF and non-CF bronchiectasis (p: 0.06). LCI was significantly increased among CF patients (mean LCI 13.7), compared to healthy children (p<0.00001). LCI was also found significantly increased among patients with non-CF bronchiectasis (mean LCI 11.8), compared to healthy children (p<0.0001). LCI was not found significantly different among children with CF and non-CF bronchiectasis (p: 0.16). Conclusions: Exercise testing and Multiple Breath Washout measurements can discriminate children with bronchiectasis from healthy children. However, the burden of the disease is more prominent in children with CF compared with the non-CF bronchiectasis.