

Longitudinal Pulmonary Evaluation in Children with Post-COVID-19 Condition and Respiratory Symptoms: A Prospective Cohort Study

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Abstract

Background: Studies on post-COVID-19 condition (PCC) in adults have shown deterioration in pulmonary function tests (PFTs), mainly a diffusion limitation. Among pediatric population data are scarce. **Aim:** To characterize PFTs of children with PCC, including changes over time. **Methods:** A prospective longitudinal study of children with defined PCC and respiratory complaints referred to a designated multidisciplinary clinic from 11/2020 to 12/2022. **Results:** 184 children at a mean age of 12.4 years (SD 4.06) were included. A mild obstructive pattern was demonstrated in 19/170 (11%) at presentation, as indicated by spirometry and/or positive exercise challenge test and/or reversibility post bronchodilators- only 3 with a previous diagnosis of asthma. Lung volumes and diffusion were normal in all but one patient (1/134, 0.7%). [Exhaled nitric oxide](<https://erj.ersjournals.com/content/21/1/43>) levels were elevated in 32/144 (22%). All 33 children who had repeated PFTs had normal or near-normal PFTs on following testing, including 7 (21.2%) who had mild obstructive PFTs at presentation. Multivariate analysis identified older age [OR 1.36 (95% CI:1.07-1.75)] and specific imaging findings [prominent bronchovascular markings (OR 43.28 (95% CI: 4.50-416.49)[and hyperinflation] (OR 28.42, 95% CI: 2.18-370.84)] as significant predictors of an obstructive pattern on PFTs. **Conclusion:** In children with PCC and respiratory symptoms, the most common impairment was mild obstructive pattern; most of them without a history of asthma. Improvement was witnessed in long-term follow-up. As opposed to the adult population, no diffusion limitation was found. Empirical periodic inhaler therapy may be considered in children with factors associated with PFTs abnormalities.

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