

The role of bronchial challenge test in guiding therapy in preschool children with atypical recurrent respiratory symptoms

Yonatan Wolfson¹, Avigdor Mandelberg¹, Tal Golan-Lagziel¹, Suzanne Sosnovsky¹, Dorit Ater², and Keren Armoni Domany¹

¹Edith Wolfson Medical Center

²Assuta Ashdod Hospital

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Abstract

Objective: This retrospective observational cohort study aimed to assess the real-life application of bronchial challenge test (BCT) in the management of preschool children presenting with atypical recurrent respiratory symptoms (ARRS). **Methods:** We included children, aged 0.5-6 years referred to a pediatric-pulmonology clinic, who underwent BCT using methacholine or adenosine between 2012-2018 due to ARRS including uncertain severity of airway hyperactivity. BCT was considered positive based on spirometry results and/or wheezing, desaturation, and tachypnea reactions. We collected data on demographics, BCT results, pre-BCT treatment, post-BCT treatment change and post-BCT symptoms control. The primary outcome measure was the change in treatment post-BCT (step-up or step-down). Secondary outcome included clinical improvement observed 3-6 months after BCT. **Results:** A total of 228 children (55% males) with a mean age of 4.2 ± 0.6 years underwent BCT (52% adenosine-BCT, 48% methacholine-BCT). Children referred for methacholine were significantly younger compared to adenosine (3.6 ± 1.2 vs. 4.2 ± 1.2 years, $P < 0.01$). Methacholine and adenosine BCTs were positive in 95% and 61%, respectively. Overall, changes in management were observed in 122(53.5%) children following BCT, with 83(36.4%) being stepped up and 37(17%) being stepped down. Significantly more children in the methacholine group were stepped up compared to the adenosine (46% vs 28%, $p=0.004$). During the follow-up assessment, we observed a clinical improvement in 119/162 (73.4%) of the children. **Conclusion:** This study demonstrates the importance of BCT in the management of preschool children presenting to pediatric pulmonary-units with ARRS. The change in treatment and subsequent clinical improvement observed, highlight the added-value of BCT in this populations.

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