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Title: Clinical predictive rules to identify preschool wheezers at risk for subsequent asthma: Can we rely on them? Could we improve their performance?

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Body: Background: Various predictive rules have been developed to identify wheezy preschoolers at risk for persistent asthma. The aim of this study was to evaluate the performance of the asthma predictive index (API), modified API (mAPI), and PIAMA score, and to examine whether the presence of reversible airflow obstruction (RAO) could improve the prediction of later asthma. Methods: This retrospective study included 92 children aged 6-8 years with recurrent wheeze who had regular follow-up for the last 4 years. Active asthma was defined as doctor-diagnosed asthma or wheeze that required long-term medication in the previous 12 months. RAO was defined as bronchodilator response ≥30% for respiratory resistance and ≥35% for respiratory reactance determined with the forced oscillation technique (FOT). Results: Active asthma was present in 32 children (34.8%). 21 children (22.8%) had positive API, 10 (10.9%) positive mAPI, and 55 (59.8%) had PIAMA score ≥20. RAO was documented in 25 children (27.2%). The stringent API had positive and negative likelihood ratio (LR+ and LR–) 3.0 and 0.69 respectively. The mAPI had LR+ 16.9 and LR– 0.73, and the PIAMA score LR+ 1.5 and LR– 0.52. The combination of API (or mAPI) and RAO resulted in LR+ 3.8 and LR– 0.24 (LR+ 3.2 and LR– 0.4, respectively), whereas the combination of PIAMA score and RAO resulted in LR+ 1.4 and LR– 0.39. Conclusion: All tested indices had limited overall ability to predict –especially to rule-out– subsequent asthma in preschoolers with recurrent wheeze. Combination of asthma predictive models with FOT-determined RAO may improve the prediction of later asthma in wheezy young children.