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| **Assessment of a bronchodilator response in preschoolers: a systematic review** |
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| **Introduction/Aim:** A bronchodilator response (BDR) can be assessed in preschool-aged children using one of four preschool lung function techniques - spirometry, respiratory oscillometry, the interrupter technique, and specific airway resistance – yet a systematic comparison of BDR thresholds across studies has not been completed.  **Methods:** A systematic review was performed on all studies up to May 2023 measuring a bronchodilator effect in children 2-6 years old using one of these techniques (PROSPERO CRD42021264659). Studies were identified using MEDLINE, Cochrane, EMBASE, CINAHL via EBSCO, Web of Science databases, and reference lists of relevant manuscripts.  **Results:** Of 1224 screened studies, 43 were included. Over 85% were from predominantly Caucasian populations, and only 22 studies (51.2%) calculated a BDR cut-off based on a healthy control group. Sample sizes ranged from 25-916. Only two studies (4.6%) adhered to formal recommendations for study design: at least 300 subjects, randomised for placebo response testing in healthy children, and accounted for within-session and between-session test repeatability. A relative BDR was most consistently reported by the included studies (95%) but varied widely across all techniques (Figure 1). However, a variety of statistical methods were used to define a BDR. The highest BDR feasibility was reported with oscillometry techniques in this age group.  **Conclusion:** Our review highlighted the marked variation across BDR protocols, cut-off calculations, and presentation of results in children 2-6 years old. Precise and feasible evaluation of lung function in young children is crucial for early detection and intervention of airway diseases. Future studies must adopt a more standardised approach if robust BDR thresholds are to be determined for these techniques.  **Grant Support:** Thrasher Research Fund; Queensland Health Innovation, Investment and Research Office; The University of Queensland Faculty of Medicine.   |  | | --- | | Figure 1. Relative BDR (BDR%INIT) for spirometry (top), impulse oscillometry (middle), and spectral oscillometry (bottom) with shapes corresponding to lung function variables and coloured numbers corresponding to referenced studies. | |