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Title: Feasibility and safety of mannitol challenge in pre-school children using forced oscillations

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Body: Background: The mannitol dry powder challenge is used to identify exercise induced bronchoconstriction (EIB) in adults and school-age children. The forced oscillation technique (FOT) is suitable for assessing lung function in pre-school children and can be combined with inhaled challenge testing in this age group. Aims: This study aimed to assess the safety and the feasibility of a mannitol challenge using FOT in young children with asthma and in healthy controls. Methods: Healthy children and children with exercise induced symptoms (EIS group) aged 3-7 years were recruited. A mannitol challenge (Aridol, Pharmaxis, Australia) was performed. A positive response to mannitol was defined as wheeze on auscultation, persistent cough, SpO2 <90% or increase in respiratory system resistance at 8Hz (Rrs8) > 50% from control. The mannitol challenge was considered successful if the child completed the challenge to the final dose or a positive response was noted. Results: To date, 6 healthy and 10 EIS children have been studied. 14 children successfully completed the mannitol challenge with no adverse events. Two healthy children aged 3 years did not complete the test due to lack of cooperation. Three children with reported EIS responded to the challenge with symptoms, and three children responded by an increase in the Rrs8 by >50% from the control measurement. Conclusion: These preliminary results suggest that a mannitol challenge test is feasible in young children and can be performed safely. Funded by: ANZSRS Research Grant, Asthma Foundation WA.