Abstract Group: 5.2. Monitoring Airway Disease

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Title: Development of a new bronchial provocation test with dry powder adenosine

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Body: Introduction Adenosine is an indirect stimulus to assess bronchial hyperresponsiveness (BHR), a hallmark of asthma. Bronchial provocation is usually performed with a solution of adenosine 5’-monophosphate (AMP) administered via a nebuliser. This nebulised AMP test has several disadvantages. It is a time-consuming method and AMP can be dissolved to a maximum concentration of 320 mg/ml resulting in BHR in only half of the asthma patients. Aim To develop a new provocation test using dry powder adenosine to assess BHR. Methods Dry powder adenosine was prepared in different dose steps (range 0.01 - 80 mg) derived from the regular AMP test with addition of 2 extra dose steps. Five patients with asthma performed two provocation tests; first a test with dry powder adenosine administered via a dry powder inhaler (Twincer™ concept) and inhaled with a single slow inspiration (30 L/min); secondly a test with nebulised AMP according to the 2-minute tidal breathing method. Results All 5 patients reached a 20% fall in FEV1 with the new dry powder adenosine test (PD20) compared to 4 patients with the AMP test (PC20). The AMP-negative patient reached a PD20 after inhaling 80 mg of adenosine, a higher dose than the last step of 320 mg/ml (±28 mg) AMP. The new dry powder adenosine test was well tolerated by all patients and much easier and quicker to carry out than the regular AMP test. Conclusion The new dry powder adenosine provocation test appears to be a reliable and safe alternative for the regular AMP test to assess BHR in patients with asthma. The dry powder adenosine test has several improvements compared to the AMP test, i.e. lower burden on the patient and it allows provocation with higher dose steps.