AMP and adenosine induced dyspnea perception associated to large and small airways dysfunction in asthma
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Introduction
Bronchial provocation is often used to diagnose asthma or monitor disease control. Dyspnea perception, however, associates poorly with the induced drop in FEV1. Some subjects perceive dyspnea well before the drop, while others perceive none. This discrepancy may arise from the origin of dyspnea. As a provocation test solely uses the large airways parameter FEV1, although dyspnea is associated with both large- and small-airways dysfunction.

Aims
We explored if induced dyspnea perception is equal for nebulized adenosine 5’-monophosphate (AMP) and dry powder adenosine, targeting large and small airways, respectively. Further, we investigated if dyspnea perception associates better with large or small-airways dysfunction.

Methods
For this study, we used the baseline data of the previously published OLiVIA study1, in which asthmatics performed an AMP and an adenosine provocation. All 59 subjects performed spirometry, impulse oscillometry (IOS), and Borg dyspnea score, of whom 36 completed a multiple breath nitrogen washout (MBNW). Spearman’s correlation analysis was used to associate the change(Δ) in Borg score to the change in large and small-airways parameters. To construct a linear multivariate regression model a large and a small airways parameter2 was selected (lowest p-value) from spirometry and IOS. MBNW was analyzed separately.

Results
• Provocation with adenosine and AMP evoked a decreases in FEV1 of 23.4±8% and 21.1±8%, respectively.

Table 1: Baseline characteristics

Table 2: Multivariate models for ΔBorg

Conclusions
• AMP and adenosine induce equally severe dyspnea perception.
• Dry powder adenosine-induced dyspnea seems related to small-airways involvement independent of the large airways.
• AMP-induced dyspnea associates with neither large nor small-airways dysfunction.
• Our results may indicate that dry powder adenosine and nebulized AMP induce dyspnea via different processes.

References

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