Sputum induction elicits different peripheral airways responses in healthy subjects, asthma and allergic rhinitis patients

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BACKGROUND: Induced sputum (IS) is considered as the gold standard non invasive technique to assess airway inflammation. So far, the impact of the procedure on peripheral airways function in unknown.

AIM: to assess whether IS procedure is associated with airways alterarions using both ventilation distribution test (single-breath washout, SBWO) and exhaled notric oxide (FENO) as markers of peripheral airway imparment.

CONCLUSIONS:
• Sputum induction impacts small airways in all subjects tested in this study.
• However, central airways reactivity appeared to be a specific feature of asthma patients.

RESULTS: as shown on figure 1, after nebulisation
• All changes (Δ in %baseline) were significant except for FEV₁ in healthy subjects.
• ΔS_{He}≠ΔS_{SF₆} in rhinitis (p=0.049) and in asthma (p=0.003), whereas ΔS_{He}=ΔS_{SF₆} in healthy subjects (p=0.921).
• ΔFENO is larger in rhinitis and in asthma than in healthy subjects (p<0.001).
• ΔFEV₁ is greater in asthma than in rhinitis and in normal subjects (p=0.005).

Figure 1: % changes from baseline after sputum induction without salbutamol

Figure 2: Reaction area to sputum induction

METHODS:
FENO
FEV₁
SBWO
20’ induction with hypertonic saline 5% without salbutamol
FENO
FEV₁
SBWO
SBWO: phase III slope (S) of gases with different diffusivities: He and SF₆.

POPULATION:
• 22 asthma patients
• 11 rhinitis subjects
• 15 healthy volunteers

RESULTS:

Figure 2: Reaction area to sputum induction

Discussion
Those findings suggest that SI resulted in airway alterations in the 3 subjects categories. However, as shown on Figure 2, the impairment location appears to be different: proximal and up to lung periphery in asthma while restricted mostly to small airways in healthy and allergic subjects.

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