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 unsing both ventilation distribution test (single-breath washout, SBWO) and exhaled notric oxide (FENO) as markers of peripheral airway imparment.

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 SF_6.

POPULATION:

- **22 asthma patients**
- **11 rhinitis subjects**
- **15 healthy volunteers**

RESULTS: as shown on figure 1, after nebulisation

- All changes (Δ in %baseline) were significant except for FEV_1 in healthy subjects.
- $\Delta S_{He} > \Delta S_{SF6}$ in rhinitis (p=0.049) and in asthma (p=0.003), whereas $\Delta S_{He} = \Delta S_{SF6}$ in healthy subjects (p=0.921).
- $\Delta FENO$ is larger in rhinitis and in asthma than in healthy subjects (p<0.001).
- ΔFEV_1 is greater in asthma than in rhinitis and in normal subjects (p=0.005).

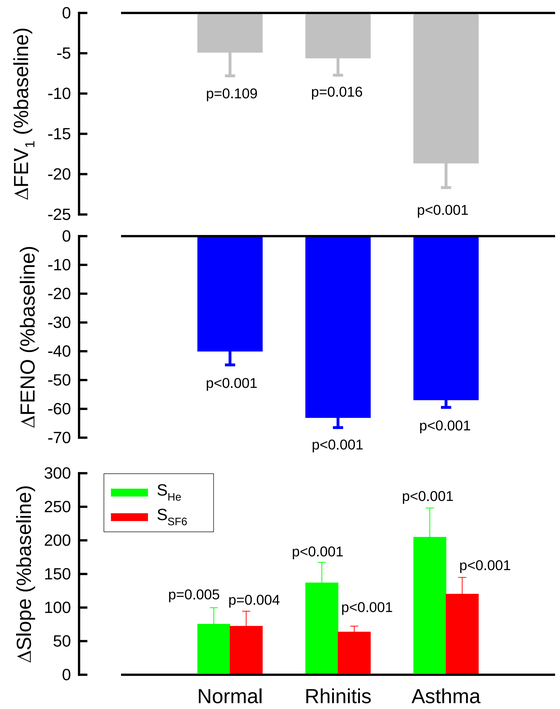

Figure 1: % changes from baseline after sputum induction without salbutamol

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.

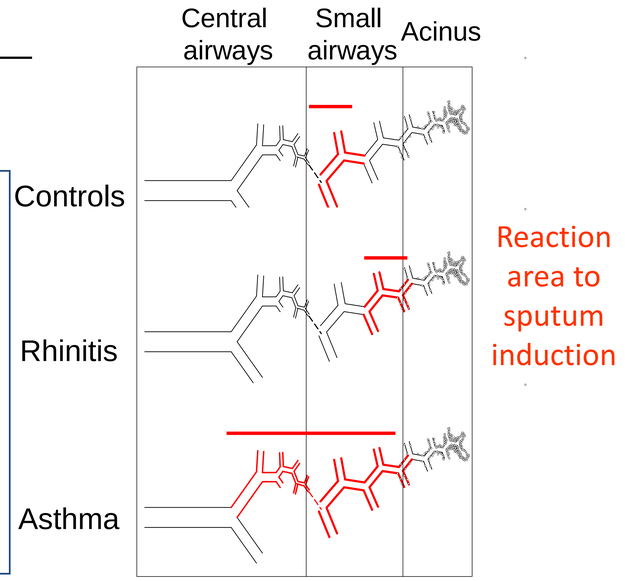

Figure 2

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.**

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