Abstract

Published literature shows that nasal secretions have been collected from the nasal mucosa by modifications of a filter paper/synthetic matrix method for many years (Alam et al. J Immunol Methods. 1992; 155(1):25-9). Inflammatory markers have been measured in samples collected by these methods.

Method

As per our adopted protocol, two Leukosorb (a highly wettable fibrous matrix) strips were applied to the inferior turbinate for 2 minutes then added to a filter tube containing 300μl buffer. Tubes were centrifuged for 20 minutes at 16,000g.

Recovered volume was measured. 32 samples were collected from both nostrils of a pool of 5 healthy subjects at 2-4 timepoints. Total protein concentration (TPC) of each sample was measured. TPC of samples from subjects sampled at different timepoints were compared (n=10) as was the variability between nostrils of the same subject (n=12).

Results

The median percentage difference between the maximum and minimum TPC from a nostril of each subject was 46% (range 13-359%). The median percentage difference between TPC of left and right nostrils at the same sample timepoint was 19 % (range 4-186%).

Conclusions

In our study, variation existed in TPC between nostrils when sampled at the same time. We suggest that, at each time-point, samples from both nostrils should be pooled to create one sample. Intra subject variability exists in our cohort of healthy subjects between time-points and between nostrils. A larger study is needed to investigate the full extent of this variability, and the influence of the 'nasal cycle' on sample characteristics before inflammatory markers e.g. cytokines can be measured with confidence.

Methods

As per our adopted protocol, two Leukosorb (a highly wettable fibrous matrix) strips were applied to the inferior turbinate of both nostrils for 2 minutes in 10 healthy subjects free from rhinitis and nasal symptoms. The sample strips were then added to a filter tube containing 300μl buffer. Tubes were centrifuged for 20 minutes at 16,000g. Recovered volume was measured. Total Protein was measured by BCA protein assay kit (Pierce, USA).

Results - 1 Individual fluctuations in total protein concentration from both left and right nostrils

The anatomy of the nose

Nasosorption Synthetic Absorptive Matrix (SAM) for nasal secretions

Conclusions

- Because of the variability in TPC from nostril to nostril at different time points it is recommended that such samples are pooled
- TPC and other markers of nasal function need to be investigated, such as rhinometry or PNIF to understand:
  1. how structural changes might influence our interpretation of inflammation read-outs in the nose such as cytokines and chemokines
  2. how such changes might influence surrogate markers of airway disease and mechanisms of therapeutic intervention
- Further studies are required to understand how the nasal cycle plays a role in inflammation