Inflammation and clinical immunology

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Methodological implications and repeatability of nasal nitric oxide - Relevance for challenge studies

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There is interest in assessing changes in nasal NO (nNO) levels as an effect marker of upper airways. In this study, we examined methodologic influences on short and long term repeatability of nNO levels assessed by a portable electrochemical analyzer. Nine atopic and eighteen healthy subjects were exposed for 4 hours in our exposure laboratory to ethyl acrylate concentrations of 0.05 ppm (sham) and mean concentrations of 5 ppm (either constant 5 ppm or variable 0 to 10 ppm). Sampling of nNO was performed by using passive aspiration either during breath holding (634 ppb) or calm tidal breathing (364 ppb, $p < 0.0001$). The intra-session (between-session) repeatability in terms of coefficient of variation (CV) was 16.4% (18.5%) using the tidal breathing and 8.6% (13.0%) when using the breath hold method, respectively. Atopic subjects demonstrated a significant increase in nNO (breath hold mean 16%, tidal breathing method mean 32%) after applying a constant ethyl acrylate concentration (5 ppm). Our findings suggest that the less elaborate tidal breathing method might be sufficient to detect significant changes at group level. Given the lower CV of breath holding we assume advantages of that approach at an individual level. Further research is needed to validate the usefulness of nNO in the evaluation of irritative, non-allergic responses.