

10th April, 2023

The Robert Jensen Award for Excellence in Respiratory Measurement

Dear ANZSRS Webmasters,

As per the award criteria (Condition 2), please find below a summary of the oral presentation I delivered at the 2023 ANZSRS ASM in Christchurch titled “Airway hyperresponsiveness detection in atopic asthma using exhaled nitric oxide”, for which I was fortunate to receive the Robert Jensen Award for Excellence in Respiratory Measurement.

In atopic asthma, eosinophilic airway inflammation (EAI) results in airway hyperresponsiveness (AHR). EAI can be assessed using Fractional Exhaled Nitric Oxide (FeNO), therefore, we explored how FeNO may be used to detect AHR.

In a group of healthy subjects and a group of untreated atopic asthma subjects, AHR was determined using a direct, indirect and placebo bronchial provocation test over 3 separate visits (randomised). All asthma subjects demonstrated AHR to both direct and indirect provocation tests, while healthy subjects did not.

Before each subject performed a provocation test, Single-Flow FeNO (i.e. 50 mL/s) was measured in addition to Multiple-Flow FeNO. From Multiple-Flow FeNO data, FeNO was plotted against expiratory flow and the power regression model of the form $y = a.x^b$ was applied to quantify the profile, where parameters a = coefficient and b = exponent.

There was a significant difference between the asthma and healthy groups for FeNO measured at 50 mL/s as well as the coefficient parameter. However, only the coefficient was able to differentiate between the two groups with a clear cut-off. The exponent showed no significant difference.

These preliminary findings suggest that the coefficient parameter derived by applying a power regression model to Multiple-Flow FeNO, may have clinical utility in detecting AHR in untreated atopic asthma. Further studies in a larger population are required.

Thank you.

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