

Trust). Subjects were stratified into 4 groups based on ACT score and FeNO level. The demographics of each group were compared.

**Statistics** Data was compared between groups using either Kruskal-Wallis or Chi Square. Mann-Whitney U test was used to determine how each group differed from one another; results were considered significant if  $p < 0.05$ .

**Results** 46.2% of all asthma patients were concordant for FeNO and asthma severity (ACT); Of these 19.7% had high FeNO ( $>25$ ppb) with poor asthma control (ACT  $<20$ ) and 26.5% had low FeNO ( $<25$ ppb) and good asthma control (ACT  $>20$ ). 53.8% demonstrated non-concordance (FeNO and ACT did not correlate). Within the FeNO/ACT concordant groups there were significantly more females and non-smokers ( $p < 0.05$  for both). Moreover, an inverse relationship was noted between change in FeNO against (1) change in ACT score and (2) change in steroids against change in FeNO ( $p < 0.05$ ).

**Conclusion** Although change in FeNO has emerged as a potential marker in asthma treatment, further studies are needed to understand the efficacy especially in the discordant groups.

## REFERENCE

1. Overview | Asthma: diagnosis, monitoring and chronic asthma management | Guidance | NICE.

## P17 DIETARY NITRATE SUPPLEMENTATION INCREASES FRACTIONAL EXHALED NITRIC OXIDE: IMPLICATIONS FOR THE ASSESSMENT OF AIRWAY HEALTH IN ATHLETES

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**Background** Fractional exhaled nitric oxide (FeNO) is a simple tool that has an established role in the assessment of airway inflammation in athletes. Specifically, FeNO provides information concerning asthma phenotypes, aetiology of respiratory symptoms, response to anti-inflammatory agents, course of disease and adherence to medication. It is recognised that FeNO can be influenced by a variety of external factors (e.g. atopic status, exercise, respiratory tract infection), however, there remains limited research concerning the impact of dietary nitrate ingestion. The primary aim of this study was therefore to evaluate the effect of acute dietary nitrate supplementation on FeNO and resting pulmonary function parameters.

**Method** The study was conducted as a randomised double-blind placebo-controlled trial. Thirty male endurance trained athletes (age:  $28 \pm 6$  yrs; BMI:  $23 \pm 2$  kg.m<sup>-2</sup>) free from cardio-respiratory and metabolic disease, and stable at time of study entry (i.e. entirely asymptomatic without recent respiratory tract infection) attended the laboratory on two separate occasions. On arrival to the laboratory, athletes consumed either 140 ml nitrate-rich beetroot juice (15.2 mmol nitrate) (NIT) or nitrate-depleted beetroot juice (0 mmol nitrate) (PLA). In accordance with international guidelines all athletes performed resting FeNO and forced spirometry (2.5 hrs post ingestion). Airway inflammation was

evaluated using established FeNO thresholds: (intermediate [ $\geq 25$ ppb] and high [ $>50$ ppb]).

**Results** All athletes demonstrated normal baseline lung function (FEV<sub>1</sub>% predicted  $>80\%$ ). A three-fold rise in resting FeNO was observed following NIT (median [IQR]): 32ppb [37] in comparison to PLA: 10ppb [12] ( $P < 0.001$ ). Twenty-two athletes (73%) presented with raised FeNO following NIT (intermediate:  $n=13$ ; high:  $n=9$ ) in comparison to four athletes (13%) following PLA (intermediate:  $n=2$ ; high:  $n=2$ ). Despite this, no difference was observed in any pulmonary function parameters between visits ( $P > 0.05$ ).

**Conclusion** Dietary nitrate ingestion should be considered when employing FeNO for the assessment of airway health in athletes. Our findings have implications concerning the decision to initiate or modify inhaler therapy. Further research is therefore required to determine the impact of chronic dietary nitrate ingestion on pulmonary function and bronchoprovocation testing in athletes with pre-existing asthma and/or exercise-induced bronchoconstriction.

## P18 AIRWAVE OSCILLOMETRY IN RELATION TO PATIENT REPORTED OUTCOMES IN ASTHMA

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**Background** Airwave oscillometry (AOS: Tremoflo, Thorasys, Montreal) uses a vibrating mesh to superimpose forced oscillations of sound waves on top of normal tidal breathing to measure respiratory impedance as lung resistance (R) and reactance (X). AOS is able to determine the degree of small airways dysfunction as either peripheral airway resistance (R5-R19) or compliance as area under the reactance curve (AX).

We therefore investigated the relationship of AOS to patient reported outcomes of asthma control (ACQ) and quality of life (mAQLQ). In particular, we were interested in ACQ which is a strong predictor of future exacerbation risk.

**Patients and methods** We evaluated 46 patients with persistent asthma: Age 51 yr, FEV<sub>1</sub> 87%, R5 142%, ICS (BDP equiv) 616 µg, 65% taking LABA, 11%, LAMA, 37% LTRA.

Using a cut point for R5-R19 of 0.08 kPa/l/s, there were differences ( $<0.08$  vs  $\geq 0.08$  kPa/l/s) in mean ACQ values: 0.99 vs 1.93 (95%CI -1.66, -0.45) (Fig) and in mAQLQ (symptoms): 5.23 vs 4.30 (CI 0.10, 1.74). For AX with a cut point of 1.0 kPa/l there were differences in ACQ: 0.99 vs 1.93 (CI -1.55, -0.33), in mAQLQ symptoms: 5.28 vs 4.42 (CI 0.06, 1.66) and mAQLQ activity: 5.92 vs 5.01 (CI 0.004, 1.81).

For the R5-R19 there was also a difference in FeNO: 30 vs 45 ppb (CI 13, 17).

For FEV<sub>1</sub> cut point of 80% pred differences were seen in ACQ: 2.20 vs 1.27 (CI 0.11, 1.76) and mAQLQ symptoms: 4.05 vs 5.09 (CI -1.93, -0.16) but not FeNO. For FEF25-75 cut point of 50% pred there were differences in ACQ 1.90 vs 1.23 (CI 0.003, 1.34) and FeNO 60 vs 35 ppb (CI 3, 48).

Differences for ACQ and mAQLQ all exceeded the respective MCID's of 0.5.

**Conclusions** Peripheral lung resistance and compliance measured by AOS are related to patient reported outcomes of