in the missed diagnosis of asthma in 13 (11%) cases and 7 (6%) cases being wrongly diagnosed with asthma.

Conclusion Current diagnostic algorithms for asthma either lack sensitivity (NICE and GINA), resulting in the under-diagnosis of asthma in around a third of cases, or provide reasonable specificity and sensitivity, but still result in misdiagnosis (either under- or over-diagnosis) in 1 in 6 people with suggestive symptoms. These data could be used to inform and test future asthma diagnostic algorithms.

**P121 UPPER AND LOWER AIRWAY DYSFUNCTION IN ELITE ATHLETES**

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10.1136/thorax-2023-BTSabstracts.273

Background Some elite athletes suffer significant loss of training and competition availability because of recurrent respiratory tract infection (RTI). Airflow limitation and upper airway dysfunction may be relevant in underlying a propensity to RTI. Bacterial microbial dysbiosis is a recognised accompaniment to airways disease, but its role in infection susceptibility, in this context, is not clear.

Methods Athletes from the UK Sports Institute (UKSI) completed a systematic assessment of their respiratory health, including measurement of exhaled nitric oxide (FeNO) and spirometry (FEV1 and FVC) with indirect bronchoprovocation testing (eucapnic voluntary hyperpnoea (EVH)). The presence of laryngeal dysfunction was assessed by the Pittsburgh Vocal Score Dysfunction questionnaire (VCD). A positive diagnosis of asthma was defined via spirometry, FeNO and EVH. The number of respiratory infections in the last 18 months was recorded. Bacterial microbial communities from posterior oropharyngeal swabs were quantified by sequencing of the 16S RNA gene.

Results We studied 127 athletes (47% female), training for international competition in a wide range of sports. There were no differences in the frequency of symptoms between sports. A total VCD score was elevated (>=4) in 20 athletes (9.4%). Approximately one third (30.7%) of the cohort were diagnosed as asthmatic and 38% had more than 2 respiratory illnesses in the previous 18 months. Asthma and VCD positive groups were quite distinct; in a backwards stepwise multiple regression, asthma was associated with bacterial biomass ($\beta = 0.121$, $p=0.02$) and *Haemophilus* spp. abundance ($\beta = 0.128$, $P=0.016$). Conversely, frequency of respiratory infections in the last 18 months was positively predicted by the presence of VCD ($\beta = -0.345$, $P=0.000$), sinusitis ($\beta = -0.219$, $P=0.014$) and wheeze $\beta = -0.182$, $P=0.04$), without any clear association with bacterial microbiota.

Discussion Asthma symptoms are prevalent in elite athletes. Our findings indicate that focus on laryngeal dysfunction may be more relevant when considering strategies to reduce RTI in this cohort of individuals.

**P122 SUSTAINED WEIGHT LOSS AND IMPROVED ASTHMA OUTCOMES AT ONE YEAR FROM A RANDOMISED CONTROLLED TRIAL OF A WEIGHT MANAGEMENT PROGRAMME FOR DIFFICULT-TO-TREAT ASTHMA AND OBESITY**

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10.1136/thorax-2023-BTSabstracts.274

Abstract P122 Figure 1 Proportion of participants achieving minimal clinically important difference in Asthma Control Questionnaire (ACQ6) and Asthma Quality of Life Questionnaire (AQLQ) with Counterweight-Plus group (CWP) and usual care (UC) over 52 weeks. Compared using $\chi^2$ or Fisher’s exact. * denotes significant result; ns = not significant.