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Title: Evaluation of fractional exhaled nitric oxide and peripheral blood eosinophil count as biomarkers in patients with refractory asthma

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Body: Introduction: The role of fractional exhaled nitric oxide (FeNO) and peripheral blood eosinophil (PBE) counts as biomarkers in refractory asthma is not well established. The aim of the study was to determine if there is a correlation between the two biomarkers in this population and to assess their relationship with a number of measures of asthma control. Methods: We retrospectively analysed the data of 102 patients with refractory asthma presenting to the Severe Asthma Unit at Birmingham Heartlands Hospital and analysed above mentioned correlation using Spearman's rank correlation coefficient (Rs). Results: The mean AQLQ and ACQ were 3.27 and 3.54 respectively suggesting poor asthma control and quality of life in refractory asthma patients. Patient on maintenance oral steroids had poorer quality of life compared to the patients not on maintenance oral steroids (mean AQLQ 2.91 vs.3.56, p=0.011). Similarly, asthma control was worse in patients on maintenance steroids (mean ACQ 3.63 vs. 3.43, p=0.36). There was positive correlation between FENO and PBE (RS= 0.42, p = 0.01) but no significant correlation was found between AQLQ&ACQ and these biomarkers. Subgroup analysis showed positive correlation between AQLQ and FENO in atopic group (RS= 0.338, p=0.03). Interestingly a weak negative correlation was seen between AQLQ and FENO in non- atopic group (RS= -0.38, p=0.075, n=22). Conclusions: Patients on maintenance oral steroids have poorer quality of life and asthma control. There is a positive correlation between FENO and PBE in refractory asthma patients but no significant correlation was found between AQLQ&ACQ and these biomarkers.