Title: Peak expiratory flow (PEF) as a predictive factor of elevated fraction exhaled nitric oxide (FENO) in young healthy swimmers in indoor chlorinated pools

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Body: INTRODUCTION: FENO testing is used in everyday clinical practice as a supplementary diagnostic and treatment monitoring tool in asthma. Furthermore, it contributes to the identification of patients at risk of exacerbation. Several epidemiological studies have pointed out that childhood indoor swimming pool attendance is implicated in the onset or triggering of asthma. Exposure to chlorine and its by-products is thought to be a key event in the development of the aforementioned pathology. However, FENO testing usefulness may vary depending on the clinical context. OBJECTIVE: The aim of the present study is to identify FENO subgroups in a population of young healthy swimmers and assess possible predictive factors that would determine group allocation. METHODS: We examined 77 children and young healthy adolescents, 10 to 18 yrs old, who had attended indoor swimming pools. FENO measurements and spirometry were performed both before and after exercise. RESULTS: Cluster analysis identified two distinct groups regarding post exercise FENO measurements: Group A and B, with mean FENO 23.11±1.7 and 5.52±4.2 respectively. Baseline PEF was the most important determinant of cluster membership (F=4.4, p=0.040). Clusters differed significantly regarding baseline FEV1/FVC (p=0.007), PEF (p=0.007), FEF25-75 (p=0.032) and post exercise PEF (P=0.041). CONCLUSIONS: The preliminary findings of our study, suggest that baseline PEF may be a significant determinant of post exercise FENO in healthy indoor swimmers.