THE ALLERGY QUESTIONNAIRE FOR ATHLETES: A SIMPLE SCREENING TOOL FOR THE ASSESSMENT OF EXERCISE-INDUCED BRONCHOCONSTRICTION

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Aim: Evaluating respiratory symptoms in athletic individuals can be difficult and therefore robust clinical assessment tools are required (1). The Allergy Questionnaire for Athletes (AQUA) is validated to assess allergic +/- respiratory symptoms (2). The purpose of this study was therefore to determine the value of AQUA as a screening tool to confirm or refute exercise-induced bronchoconstriction (EIB) in athletes.

Methods: One-hundred and forty-seven athletes (male: *n* = 100: female: *n* = 47) (age: 32 ± 9 years) completed AQUA and performed spirometry pre-and-post a eucapnic voluntary hyperpnoea challenge (EVH). A positive AQUA was determined as a score ≥5 (2). Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated and evaluated against objective evidence of EIB: (EVH threshold [-10% ΔFEV_1 at two consecutive time-points] and [-15% ΔFEV_1 at one time-point]) (3). Diagnostic accuracy was calculated using receiver operating characteristics area under the curve (ROC-AUC).

Results: All participants demonstrated normal baseline lung function (FEV_1 % predicted >80%). The prevalence of EIB was 16% (-10% ΔFEV_1) and 11% (-15% ΔFEV_1) (mean ΔFEV_1 = -7.4% ± 7.9). Eighty-seven (59%) provided a positive AQUA score (range: 0-25). ROC-AUC for AQUA was 65% (-10% ΔFEV_1) and 69% (-15% ΔFEV_1). A negative AQUA score was highly predictive of negative EVH test outcome. Sensitivity, specificity, PPV and NPV are presented in Table 1.

Conclusion: AQUA is a simple screening tool that provides value in ruling out EIB, and should be considered during clinical assessment (i.e. inform referral for objective testing) or as a 'first-step' as part of screening interventions. It is important to acknowledge that a positive AQUA score should not be used to confirm EIB, in the absence of indirect bronchoprovocation. The development and validation of an athlete specific questionnaire to confirm EIB remains an avenue for future research.

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Table 1. AQUA sensitivity, specificity, PPV and NPV for the detection of EIB.

Population*: n* = 147

Prevalence (-10% ΔFEV_1): 16%

Prevalence (-15% ΔFEV_1): 11%

		EVH				
		-10% ΔFEV_1			-15% ΔFEV_1	
		+	**-**		**+**	**-**
AQUA score	**+**	20	70	**+**	15	75
	-	3	54	**-**	1	56

	AQUA score	
	-10% ΔFEV_1	-15% ΔFEV_1
Sensitivity (%)	87	94
Specificity (%)	44	43
PPV (%)	22	17
NPV (%)	95	98

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