CC3.2 | Screening tools for work-related asthma and their diagnostic accuracy: a systematic review

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Introduction: One in four cases of asthma in adults is caused or worsened by work (work-related asthma: WRA). Early detection of WRA could prevent poor health and employment outcomes, but WRA is often missed, or diagnosis delayed. Standardised screening tools and their effectiveness in practice are not well established. We aim to summarise and compare the performance of screening tools for identifying WRA in both clinical settings and workplaces.

Methods: We searched for articles using structured questionnaires or prediction models (that may also include physiological tests) to identify WRA in clinical settings or workplaces, in MEDLINE, EMBASE, other bibliographic databases and grey literature between 1975-2021. Studies were screened independently by two reviewers using predetermined criteria, also with data extraction. Quality assessments were done using QUADAS-2 and/or PROBAST tools. Screening tools and their indices of accuracy were summarised with paired forest plots of sensitivities and specificities.

Results: Six studies were included. Four focused on occupational asthma and two on WRA. All took place in tertiary hospitals (n=4) and specialist centres (n=2). The screening tools used were questionnaire alone (n=5), questionnaire with methacholine challenge test (n=1) and diagnostic models (n=3). Questionnaire alone (generally respiratory symptoms and their relation to work) had 80-100% sensitivity and 7.7-54.9% specificity. The item ‘improvement of symptoms off work/on vacation’ showed 74-87% sensitivity and 15-57% specificity. Addition of methacholine challenge test in one questionnaire gave 65% sensitivity and 74% specificity. Diagnostic models which added extra variables (e.g. age, exposure duration, sensitization result) reported AUC 0.72-0.94.

Discussion: Questionnaires alone give a high sensitivity and low specificity for WRA, which could be sufficient for purposes of screening; adding demographic variables and objective tests can improve performance. However, studies on screening tools for WRA are few and inadequately reported; further evaluations of effectiveness are needed, especially in general populations and workplaces.