The novel 10-item asthma prediction tool: external validation in the German MAS birth cohort.

Abstract:
A novel non-invasive asthma prediction tool from the Leicester Cohort, UK, forecasts asthma at age 8 years based on 10 predictors assessed in early childhood, including current respiratory symptoms, eczema, and parental history of asthma. We aimed to externally validate the proposed asthma prediction method in a German birth cohort. The MAS-90 study (Multicentre Allergy Study) recorded details on allergic diseases prospectively in about yearly follow-up assessments up to age 20 years in a cohort of 1,314 children born 1990. We replicated the scoring method from the Leicester cohort and assessed prediction, performance, and discrimination. The primary outcome was defined as the combination of parent-reported wheeze and asthma drugs (both in last 12 months) at age 8. Sensitivity analyses assessed model performance for outcomes related to asthma up to age 20 years. For 140 children parents reported current wheeze or cough at age 3 years. Score distribution and frequencies of later asthma resembled the Leicester cohort: 9% vs. 16% (MAS-90 vs. Leicester) of children at low risk at 3 years had asthma at 8 years, at medium risk 45% vs. 48%. Performance of the asthma prediction tool in the MAS-90 cohort was similar (Brier score 0.22 vs. 0.23) and
discrimination slightly better than in the original cohort (area under the curve, AUC 0.83 vs. 0.78). Prediction and discrimination were robust against changes of inclusion criteria, scoring and outcome definitions. The secondary outcome 'physicians' diagnosed asthma at 20 years' showed the highest discrimination (AUC 0.89). The novel asthma prediction tool from the Leicester cohort, UK, performed well in another population, a German birth cohort, supporting its use and further development as a simple aid to predict asthma risk in clinical settings.