

Clinical reviews

Our panel of GPs review recent research papers in their specialist areas that may influence the way you practise

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Paediatrics

Bronchiolitis as a predictor of increased risk of future asthma

Infants with bronchiolitis characterised by a history of breathing problems, eczema and rhinovirus infection are at increased risk of developing asthma by age 6-7 years, an analysis of three prospective cohort studies has found.

The authors extracted data from three multicentre, prospective cohorts of infants with severe bronchiolitis. These studies were carried out as part of the Multicenter Airway Research Collaboration, with two performed at multiple centres in the United States and the other in three centres in Finland.

Data on 3,081 children under a year old, median age 3.3 months, were analysed. Overall, 41% were girls, 74% had bronchiolitis with RSV infection and 23% with rhinovirus infection, 12% had RSV/rhinovirus coinfection. The clinical outcome of interest was the development of asthma at age 6-7 years.

The researchers used latent class analysis (LCA) which identifies more homogeneous subgroups of patients from a large set of clinical characteristics. Patients had nine clinical variables noted: history of breathing problems, history of eczema, wheeze, cough, and inadequate oral intake, as well as

retractions at presentation, length of hospital stay and presence of RSV or rhinovirus.

To link these results to asthma risk, multivariable logistic regression models adjusting for potential confounders were used for each cohort. Finally, a decision tool to predict the profile with the highest asthma risk was developed using predictors from the LCA and further statistical analyses.

Class analysis resulted in the identification of four bronchiolitis profiles:

- **Profile A** (13%) primarily characterised by a high proportion of previous breathing problems and eczema, low prevalence of RSV, and high prevalence of rhinovirus infection
- **Profile B** (34%) had a low proportion of previous breathing problems, high proportion of wheeze at presentation, high prevalence of RSV, and low prevalence of rhinovirus infection, resembling 'classic' RSV-induced bronchiolitis
- **Profile C** (32%) the most severely ill group with a high proportion having inadequate oral intake, severe chest retraction at presentation and prolonged hospital stay
- **Profile D** (21%) the least ill group

These bronchiolitis profiles had differential risks for developing asthma by age 6-7 years. Profile A had the highest probability of developing asthma with a 2.5 increased odds compared with profile B (the classic bronchiolitis profile) adjusted odds ratio (OR) 2.57 (95% CI: 1.63-4.06).

Further analysis led to the development of a decision tree which accurately predicted that profile A had the highest risk for developing asthma.

The authors comment that: 'Despite the ongoing challenges of accurately predicting high-risk infants, our observations support cautious optimism that a subgroup of bronchiolitis patients who are likely to develop asthma can be identified

before asthma inception, which provides a critical window for preventive interventions.'

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Fujiogi M, Dumas O, Hasegawa K et al. Identifying and predicting severe bronchiolitis profiles at high risk for developing asthma: analysis of three prospective cohorts. *eClinicalMedicine* 2022;43:101257

