Incidence and risk factors of pediatric asthma exacerbations in a multinational, multidatabase cohort study

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Background: There is sparse real life evidence on the risk factors and incidence of asthma exacerbations (AE) in children.

Aims: To assess incidence and risk factors of AE in children with moderate to severe asthma in real life.

Methods: Patients aged 5-17 years with ≥ 1 year of follow-up were identified in six European electronic health record databases from the Netherlands, Italy, UK, Denmark and Spain in 2008-2013. Asthma was defined as >1 asthma prescription within 3 months of an asthma diagnose code, severe asthma also required use of high dose inhaled corticosteroids combined with controller therapy. AE was defined as need of oral steroids, emergency department visit or hospitalization for asthma. Risk factors for AE were estimated by multivariate Poisson regression analyses.

Results: The cohort consisted of 226, 343 asthma patients (mean age in the databases 7.2-14.8 years), contributing 723, 674 patient years (PY). The proportion of severe asthma ranged between 1.6-15.5%. AE rates ranged between 17-188/1, 000 PY, and were higher in severe asthma patients (41-326/1, 000 PY). In most databases girls had a higher AE rate than boys from adolescence on, and vice versa in young children. The risk was mainly increased by previous AE (incidence rate: 3-29), and also by atopy and high blood eosinophilia (≥ 300 cells/uL). Obesity was a risk factor of AE in some databases.

Conclusions: In a real world setting, we showed high AE rates, with highest rates in children with severe asthma. Risk of exacerbation depended on age, gender, comorbidities and previous AE. Asthma management focusing on prevention of AE is important to reduce the burden of asthma.

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