Online Repository

**Identifying risk of future asthma attacks using UK medical record data: a Respiratory Effectiveness Group initiative**

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**Supplementary Methods**

The study was conducted in line with recommendations for observational research, including an *a priori* research plan, study registration, commitment to publish, and an independent steering committee not remunerated for their participation.E1,E2 The study protocol was approved by the Anonymised Data Ethics Protocols and Transparency (ADEPT) committee, the independent scientific advisory committee for the OPCRD, and was registered with the European Network of Centres for Pharmacoepidemiology and Pharmacovigilance (ENCePP http://www.encepp.eu/encepp/viewResource.htm?id=6303).E3

The Charlson comorbidity index (CCI) scoreE4 in the baseline year was categorized as 0, 1–4, 5–9, ≥10, with comorbidity weights taken from the Hospital Standardised Mortality Ratios.E5

Post-hoc power calculations showed that the large study population of 118,981 patients provided sufficient statistical power (≥80%; α=0.05) to detect an association with an odds ratio of 1.10 for the risk of two or more asthma attacks, assuming a risk of 11% in patients without the characteristic of the predictor and a prevalence of the characteristic of at least 8%. For the risk of four or more asthma attacks, the study population size would allow detecting an odds ratio of 1.17, assuming a risk of 3.0% in patients without the characteristic for predictors with a prevalence of at least 9%.

**Supplementary Results**

Additional patient demographic and clinical characteristics are depicted in Online Repository Table E1.E6

**Univariable analyses**

All of the potential baseline risk factors tested in univariable analyses with the exception of beta blocker prescriptions (yes/no) were significantly associated with the presence of asthma attacks (≥2 or ≥4 attacks) in the follow-up period (study years 2 and 3; Online Repository Table E2).E6–E9

**Multivariable analyses**

Age was collinear with gastroesophageal reflux disease (GERD) diagnosis (active/ever) and/or GERD drugs, cardiovascular disease diagnosis, and prescriptions for statins.

Acute oral corticosteroid (OCS) courses were collinear with acute OCS courses with evidence of lower respiratory consultation, antibiotic courses (with evidence of lower respiratory consultation), acute respiratory events, and severe exacerbations (baseline year).

Inhaled corticosteroid (ICS) adherence was collinear with number of ICS prescriptions and inhalers, ICS average daily dose, ICS prescribed and actual duration, and number of SABA prescriptions and inhalers.

ICS prescribed dose was collinear with ICS device type.

Rhinitis diagnosis (active) was collinear with rhinitis diagnosis (ever), rhinitis diagnosis (active)/drugs, and rhinitis diagnosis (ever)/drugs.

Eczema diagnosis (active) was collinear with eczema (ever).

GERD diagnosis (active) was collinear with GERD diagnosis (ever).

Primary care consultations were collinear with diabetes diagnosis, asthma consultations, CCI score, paracetamol prescriptions, antibiotic courses, and asthma control status.

NSAID prescriptions were collinear with paracetamol prescriptions.

During the stepwise backward logistic regression, heart failure and anxiety/depression were dropped from the final model for two or more attacks; and diagnoses of gastroesophageal reflux disease (GERD, active), heart failure, eczema (active), andanxiety/depression, as well as prescriptions for nonsteroidal anti-inflammatory drugs were dropped from the final model for four or more attacks.

**References**

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**FIGURE E1.** Patient flow chart showing selection of eligible patients in the Optimum Patient Care Database.

COPD, chronic obstructive pulmonary disease; OPCRD, Optimum Patient Care Research Database.

**FIGURE E2.** Receiver operating characteristic curve for the model predicting risk of ≥2 asthma attacks in the 2-year outcome period.

**FIGURE E3.** Receiver operating characteristic curve for the model predicting risk of ≥4 asthma attacks in the 2-year outcome period.