SUPPLEMENTARY MATERIAL

Study design

1. Database description

Coverage in the NHS in Catalonia is universal. According to *Idescat* (the Statistical Institute of Catalonia), in 2017, there were 7,555,830 residents in Catalonia. Numbers provided by *AQuAS* indicated that 99.1% of them were covered in the NHS. Therefore, the database virtually encompasses the entire population of Catalonia that uses public health resources. Medical records include a patient identifier, registry date in a primary, hospital or A&E care, medical diagnosis, medical procedures, and registries of drug consumption regarding the type of drug and Define Daily Dosage (DDD).

2. Diagnostic codes

The following ICD-9-CM codes for asthma were considered: 493 (Asthma), 493.0 (Extrinsic asthma), 493.00 (Extrinsic asthma, unspecified), 493.01 (Extrinsic asthma with status asthmaticus), 493.02 (Extrinsic asthma with - acute- exacerbation), 493.1 (Intrinsic asthma), 493.10 (Intrinsic asthma, unspecified), 493.11 (Intrinsic asthma with status asthmaticus), 493.12 (Intrinsic asthma with (acute) exacerbation), 493.2 (Chronic obstructive asthma), 493.20 (Chronic obstructive asthma, unspecified), 493.21 (Chronic obstructive asthma with status asthmaticus), 493.22 (Chronic obstructive asthma with (acute) exacerbation), 493.8 (Other forms of asthma), 493.81 (Exercise-induced bronchospasm), 493.82 (Cough variant asthma), 493.9 (Asthma unspecified), 493.90 (Asthma, unspecified type), 493.91 (Asthma, unspecified type, with status asthmaticus), 493.92 (Asthma, unspecified type, with (acute) exacerbation).

3. Treatment codes

Treatment codes were (ATC codes are given in parentheses): 1. Short Acting Beta Agonists (SABA) - salbutamol (R03AC02; R03CC02), terbutaline (R03AC03; R03CC03). 2. Inhaled corticosteroids (ICS) - beclomethasone - dipropionate, ultrafine, extrafine- (R03BA01), budesonide (R03BA02), fluticasone propionate (R03BA05), mometasone

furoate (R03BA07), ciclesonide (R03BA08). 3. Leukotriene receptor antagonist (LTRAs) - zafirlukast (R03DC01), montelukast (R03DC03). 4. Long-Acting Beta Agonists (LABA) - salmeterol (R03AC12), formoterol (R03AC13). 5. Corticosteroids for systemic use (OCS) - betamethasone (H02AB01), dexamethasone (H02AB02), methylprednisolone (H02AB04), prednisolone (H02AB06), prednisone (H02AB07), trigon depot (H02AB08), hydrocortisone (H02AB09), deflazacort (H02AB13). 6. Biological agents: omalizumab (R03DX05), reslizumab (R03DX08), mepolizumab (R03DX09). 7. Drug combinations - salbutamol and ipratropium bromide (R03AL02), salbutamol and sodium cromoglicate (R03AK04), salmeterol and fluticasone (R03AK06), formoterol and budesonide (R03AK07), formoterol and beclomethasone (R03AK08), vilanterol and fluticasone furoate (R03AK10), formoterol and fluticasone (R03AK11), salbutamol and beclomethasone (R03AK13). 8. Other medications - ipratropium bromide (R03BB01), tiotropium bromide (R03BB04), theophylline (R03DA04), azithromycin (J01FA10).

4. Administered drug dosage

The DDD is a measure developed by the World Health Organization that indicates the assumed average maintenance dose per day for a drug used for its main indication in adults (World Health Organization, 2020). It does not necessarily reflect the prescribed daily dose, which may vary according to the patient's characteristics, but it allows international drug consumption comparisons.

Outcomes

5. Comorbidities

The following multi-morbidities were studied (main ICD-9-CM): acute rhinosinusitis (ARS) (460, 461.X, 465, 465.8, 465.9), acute bronchitis (466.X), acute respiratory infections (519.8), allergic rhinitis (AR) (477.X), chronic rhinosinusitis (CRS) (473.X), CRS with nasal polyps (CRSwNP) (471, 471.0, 471,9), atopic dermatitis (AD) (691.8, 692.9), bronchiectasis (494.X), chronic obstructive pulmonary disease (COPD) (491.21, 491.0), obstructive sleep apnea (327.2X, 780.57). Also, gastroesophageal reflux disease,

ischemic heart disease, food allergy, not a specified allergy, hypertension, overweight, paradoxical vocal cord dysfunction, dyslipidaemia, diabetes, Parkinson's disease, epilepsy, depression, multiple sclerosis, anxiety, dementia, diseases due to alcohol consumption, diseases derived from tobacco, organ failure (heart, liver, renal), and stroke were analysed.