Management of chronic airway diseases

Chalmers, James D.

Published in:
COPD: Journal of Chronic Obstructive Pulmonary Disease

DOI:
10.1080/15412555.2017.1286164

Publication date:
2017

COPD: Journal of Chronic Obstructive Pulmonary Disease

ISSN: 1541-2555 (Print) 1541-2563 (Online) Journal homepage: http://www.tandfonline.com/loi/icop20

Management of chronic airway diseases: What can we learn from real-life data?

James D. Chalmers

To cite this article: James D. Chalmers (2017) Management of chronic airway diseases: What can we learn from real-life data?, COPD: Journal of Chronic Obstructive Pulmonary Disease, 14:sup1, S1-S2, DOI: 10.1080/15412555.2017.1286164

To link to this article: http://dx.doi.org/10.1080/15412555.2017.1286164

COPD: JOURNAL OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE
2017, VOL. 14, NO. S1, S1–S2
http://dx.doi.org/10.1080/15412555.2017.1286164

Taylor & Francis
Taylor & Francis Group

INTRODUCTION

OPEN ACCESS

Management of chronic airway diseases: What can we learn from real-life data?

James D. Chalmers

Ninewells Hospital and Medical School, University of Dundee, Dundee, UK

Chronic obstructive pulmonary disease (COPD), alpha-1 antitrypsin deficiency (AATD) and non-cystic fibrosis bronchiectasis (hereafter referred to as bronchiectasis) are distinct but related airway diseases:

- COPD is characterised by persistent and usually progressive airflow limitation associated with an enhanced chronic inflammatory response in the airways and lung to noxious particles or gases (1). COPD is a clinical and physiological diagnosis.
- AATD is a genetic disorder that causes defective production of alpha-1-antitrypsin (AAT), leading to decreased AAT activity in the blood and lungs and deposition of excessive abnormal AAT protein in liver cells (2). AATD is a laboratory diagnosis.
- Bronchiectasis is characterised by the presence of airway dilatation and wall thickening on imaging (e.g. computed tomography [CT]), with persistent or recurrent bronchial infection (3). Bronchiectasis is a pathological or radiological diagnosis.

Despite differences in the pathobiology of these conditions, they share many of the same clinical features and many of the same challenges. A definitive diagnosis is often complicated by symptom non-specificity as illustrated in a case study.

Case study

A 60-year-old female presented with breathlessness, cough and sputum production. She had a history of childhood asthma, but had been well for many years without chest symptoms. Over the past 5 years, she had experienced worsening respiratory symptoms, including two chest infections in the past year, which required treatment with antibiotics. The most recent infection had a sputum culture positive for *Haemophilus influenzae*. Spirometry indicated a FEV_1 of 47% predicted with no reversibility to salbutamol. The patient was diagnosed with COPD and started on inhaled bronchodilators and corticosteroids, in line with the clinical picture.

But what if we were to factor in a smoking history of less than 5 pack-years? Non-smoking COPD or COPD associated with minimal smoking is recognised, but should nevertheless prompt the consideration of other diagnoses (4).

What about AATD? AATD may be associated with the onset of COPD at a young age and with more severe COPD relative to the amount smoked (2).

What about chronic asthma? The patient had not had symptoms for decades, and it is not clear whether childhood asthma is relevant.

What about bronchiectasis? A diagnosis of bronchiectasis is made more likely by the fact that most patients are female and that average age at presentation is around 60 years (5). Cough, sputum and airflow obstruction are common findings and a large proportion of patients are initially diagnosed with COPD before the correct diagnosis is made by CT scan (6).

A high-resolution CT scan confirmed bilateral bronchiectasis with no emphysema. AAT levels were within the normal range. The patient improved significantly with physiotherapy and antibiotics.

A new approach to chronic airway diseases

Chronic airway diseases carry significant individual and societal burden. COPD is a major challenge to health care systems worldwide due to its high prevalence and associated morbidity and mortality (7). AATD is the primary diagnosis in approximately 1% of COPD cases and is typically associated with a more severe course; yet, the majority of cases go undetected because screening tests in at-risk populations are underutilised (8). Bronchiectasis is becoming increasingly prevalent, particularly in older age groups (≥50 years), and is associated with substantially greater mortality compared with that in the general population (6). Overlap between these three conditions tends to worsen prognosis and has major implications for investigative and treatment strategies (9). Indeed, patients may have bronchiectasis, COPD and AATD concurrently. Co-morbidities are common and are the strongest predictors of mortality in COPD. Recent data show that patients with bronchiectasis have an average of four co-morbid diagnoses, many of which substantially increase mortality (10).

The traditional 'syndromic' approach to medicine and to respiratory medicine in particular is no longer sustainable in the modern era of aging populations and multimorbidity. Personalised medicine indicates the need to recognise the unique features of each individual's disease and to target therapy to those who will respond, while minimising treatment harms (10). This begins by recognising that COPD and bronchiectasis

CONTACT James D. Chalmers j.chalmers@dundee.ac.uk Ninewells Hospital and Medical School, University of Dundee, Dundee, DD1 9SY, UK.

are umbrella terms that include a wide range of Underlying causes, associated co-morbidities and varying inflammatory profiles (1,10,11).

This symposium, as part of the European Respiratory Society's International Congress 2016, provided an ideal forum for respiratory disciplines to meet and share their experience and expertise. There is much that the specialities can learn from each other. AATD has led the way in establishing highly successful patient registries (12,13). COPD is well advanced in 'phenotype' identification and boasts an impressive collection of large and informative observational studies (14,15). In the setting of chronic airway disease, well-conducted observational studies are often better equipped to answer clinical questions than randomised controlled trials (RCTs). Due to strict inclusion and exclusion criteria (e.g. age, underlying diagnosis, co-morbidities), RCTs are frequently not representative of the populations they aim to treat (16). Moreover, patient recruitment in rare diseases can be a challenge. At present, management of COPD, AATD and bronchiectasis tends to be informed primarily by clinical experience, although it is recognised that development of best practice recommendations will require a combination of good-quality RCTs and excellent observational studies.

It is my pleasure to introduce these symposium proceedings, which highlight the important contribution of real-life data and registries to improving outcomes in patients with AATD, bronchiectasis and COPD.

Declaration of interest

James D. Chalmers currently holds research grants from Aradigm Corporation, AstraZeneca, Bayer Healthcare, Boehringer Ingelheim, European Union Innovative Medicines Initiative, GlaxoSmithKline, Insmed, Medical Research Council, Pfizer, Polyphor, Scottish Government, and Wellcome Trust. He has received fees for consultancy or speaking from AstraZeneca, Bayer Healthcare, Chiesi, Grifols, Napp, and Pfizer.

Editorial assistance was provided by Content Ed Net (Madrid, Spain) with funding from Grifols SA (Barcelona Spain).

References

1. Agusti A, Bel E, Thomas M, Vogelmeier C, Brusselle G, Holgate S, et al. Treatable traits: toward precision medicine of chronic airway diseases. Eur Respir J 2016; 47(2):410–419.
2. Greulich T, Nell C, Hohmann D, Grebe M, Janciauskiene S, Koczulla AR, Vogelmeier CF. The prevalence of diagnosed α1-antitrypsin deficiency and its comorbidities: results from a large population-based database. Eur Respir J 2017; 49(1). pii: 1600154.
3. Chalmers JD, Aliberti S, Blasi F. Management of bronchiectasis in adults. Eur Respir J 2015; 45(5):1446–1462.
4. Salvi SS, Barnes PJ. Chronic obstructive pulmonary disease in non-smokers. Lancet 2009; 374(9691):733–743.
5. Aliberti S, Lonni S, Dore S, McDonnell MJ, Goeminne PC, Dimakou K, et al. Clinical phenotypes in adult patients with bronchiectasis. Eur Respir J 2016; 47(4):1113–1122.
6. Quint JK, Millett ER, Joshi M, Navaratnam V, Thomas SL, Hurst JR, et al. Changes in the incidence, prevalence and mortality of bronchiectasis in the UK from 2004 to 2013: a population-based cohort study. Eur Respir J 2016; 47(1):186–193.
7. Soriano JB, Rodríguez-Roisin R. Chronic obstructive pulmonary disease overview: epidemiology, risk factors, and clinical presentation. Proc Am Thorac Soc 2011; 8(4):363–367.
8. Greulich T, Vogelmeier CF. Alpha-1-antitrypsin deficiency: increasing awareness and improving diagnosis. Ther Adv Respir Dis 2016; 10(1):72–84.
9. Hurst JR, Elborn JS, De Soyza A; BRONCH-UK consortium. COPD-bronchiectasis overlap syndrome. Eur Respir J 2015; 45(2): 310–313.
10. McDonnell MJ, Aliberti S, Goeminne PC, Restrepo MI, Finch S, Pesci A, et al. Comorbidities and the risk of mortality in patients with bronchiectasis: an international multicentre cohort study. Lancet Respir Med 2016; 4(12):969–979.
11. Barnes NC, Sharma R, Lettis S, Calverley PM. Blood eosinophils as a marker of response to inhaled corticosteroids in COPD. Eur Respir J 2016; 47(5):1374–8132.
12. Stockley RA. Antitrypsin deficiency assessment and programme for treatment (ADAPT): the United Kingdom registry. COPD 2015; 12(Suppl. 1):63–68.
13. Fähndrich S, Herr C, Greulich T, Seibert M, Lepper PM, Bernhard N, et al. Sex differences in alpha-1-antitrypsin deficiency lung disease-analysis from the German registry. COPD 2015; 12(Suppl. 1): 58–62.
14. Morélot-Panzini C, Gilet H, Aguilaniu B, Devillier P, Didier A, Perez T, et al. Real-life assessment of the multidimensional nature of dyspnoea in COPD outpatients. Eur Respir J 2016; 47(6):1668–1679.
15. Agustí A, Rennard S, Edwards LD, MacNee W, Wouters E, Miller B, et al. Clinical and prognostic heterogeneity of C and D GOLD groups. Eur Respir J 2015; 46(1):250–254.
16. Chalmers JD, McDonnell MJ, Rutherford R, Davidson J, Finch S, Crichton M, et al. The generalizability of bronchiectasis randomized controlled trials: a multicentre cohort study. Respir Med 2016; 112: 51–58.