Medications for chronic obstructive pulmonary disease: a historical non-interventional cohort study with validation against RCT results

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Declared competing interests of authors: James R Carpenter is funded 50% by a grant from the Medical Research Council (MRC) (London, UK) via a secondment to the MRC Clinical Trials Unit (grants MC_UU_12023/21 and MC_UU_12023/29). He reports grants from the National Institute for Health Research (NIHR) (RP-PG-0614-20011) and the Economic and Social Research Council (ESRC) (Swindon, UK; MR/V020641/1 and ES/V005448/1), undertakes methodological consultancy work for Novartis Pharmaceuticals UK Ltd (London, UK) and GlaxoSmithKline plc (Brentford, UK), and has given missing data courses for GlaxoSmithKline plc, Bayer AG (Leverkusen, Germany) and Boehringer Ingelheim (Ingelheim am Rhein, Germany). Lesley Wise is an independent consultant to the pharmaceutical industry and is employed to provide advice by a number of different companies, none of which is involved in this therapeutic area. Sebastian Schneeweiss is a consultant to World Health Information Science Consultants, LLC (Dedham, MA, USA) and to Aetion, Inc. (New York, NY, USA), a software manufacturer of which he also owns equity. He is principal investigator of investigator-initiated grants to the Brigham and Women's Hospital (Boston, MA, USA) from Bayer, Genentech Inc. (South San Francisco, CA, USA) and Boehringer Ingelheim, unrelated to the topic of this study. He does not receive personal fees from biopharmaceutical companies. Sebastian Smeeth reports grants from Wellcome (London, UK), MRC, NIHR (14/49/159 – Statin Web-based Investigation of Side Effects Trial), the British Heart Foundation (London, UK), Diabetes UK (London, UK), ESRC and the European Union; grants and personal fees for advisory work from GlaxoSmithKline plc, and personal fees for advisory work from AstraZeneca plc (Cambridge, UK). He was a trustee of the British Heart Foundation (June 2014–May 2020). Jennifer K Quint's research group has received funding from MRC, Wellcome, the British Lung Foundation (London, UK), GlaxoSmithKline plc, Boehringer Ingelheim, AstraZeneca plc and Insmed, Inc. (Bridgewater Township, NJ, USA) for other projects, none of which relate to this work. Ian Douglas is funded by an unrestricted grant from GlaxoSmithKline plc and has consulted for, and holds stock in, GlaxoSmithKline plc.

Published August 2021
DOI: 10.3310/hta25510

Plain English summary

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Health Technology Assessment 2021; Vol. 25: No. 51
DOI: 10.3310/hta25510

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Chronic obstructive pulmonary disease affects 3 million people in the UK and is characterised by breathing difficulties that get worse over time, with sudden acute symptoms (exacerbations), possibly requiring hospitalisation. The evidence for use of medicines for treating chronic obstructive pulmonary disease comes from randomised controlled trial results. Randomised controlled trials generally include younger people with severe disease who do not have any other illnesses apart from chronic obstructive pulmonary disease, meaning that the effectiveness of these trials in all people with chronic obstructive pulmonary disease is unknown. Very large databases of anonymous electronic health records captured during NHS consultations can be used to study patients excluded from trials. However, confidence in results from studies using these data can be low because of fears of unaccounted bias, as patients are not randomised to treatment. In this project, we selected a group of patients from a very large electronic health record database called the Clinical Practice Research Datalink who were very similar to participants in a well-known large chronic obstructive pulmonary disease randomised controlled trial [the TORCH (TOwards a Revolution in COPD Health) trial]. When we analysed data from these patients, we found very similar results to the TORCH trial in relation to the reduction of exacerbations, development of pneumonia and time until death, when comparing one chronic obstructive pulmonary disease treatment with another. Having shown that our methods could be trusted to produce valid results when comparing one chronic obstructive pulmonary disease treatment with another, we then went on to analyse patients in the Clinical Practice Research Datalink who would have been excluded from the TORCH trial for the following reasons: aged > 80 years, having asthma as well as chronic obstructive pulmonary disease, or having only mild chronic obstructive pulmonary disease. For exacerbations, we found that, for people with milder chronic obstructive pulmonary disease, one of the treatments we studied seemed to work better than in the trial. For the analysis of mortality, we found that, for people with asthma as well as chronic obstructive pulmonary disease, one of the treatments seemed not to work so well, with more people dying. Future studies are needed in different populations (such as in a database from another country) to confirm these results.

Health Technology Assessment

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 4.014

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, the Cochrane Library and Clarivate Analytics Science Citation Index.

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The research reported in this issue of the journal was funded by the HTA programme as project number 15/80/28. The contractual start date was in April 2017. The draft report began editorial review in October 2020 and was accepted for publication in May 2021. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health and Social Care. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health and Social Care.

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