Evaluating the Impact of Green Prescribing on Respiratory Disease Control: A Quality Improvement Project

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Abstract

Green prescribing promotes environmentally sustainable healthcare by encouraging the use of lower-carbon alternatives, such as dry powder inhalers (DPIs) in place of metered-dose inhalers (MDIs). This quality improvement project evaluated disease control in 54 patients with asthma or COPD who were switched from MDIs to DPIs as part of routine care.

Keywords: green prescribing, respiratory disease control, quality improvement

Introduction

Green prescribing involves selecting and prescribing medications or medical devices that have a lower environmental impact while ensuring effective patient care. This practice is part of sustainable healthcare efforts to reduce the carbon footprint of the healthcare sector, particularly in areas like pharmaceuticals and medical devices.

It is important to distinguish the focus of this investigation, the impact of selecting medications or medical devices based on their carbon footprint and environmental impact, from green social prescribing, which involves healthcare professionals recommending non-clinical, nature-based interventions such as exercise, dietary changes, mindfulness sessions, and social or environmental activities.

Green prescribing typically includes, but is not limited to, promoting reusable or recyclable medical devices to minimize waste (1) and prioritizing medications that require less energy-intensive production processes or generate less waste throughout their lifecycle (2). One example is switching patients to environmentally friendly inhalers, such as dry powder inhalers (DPIs) or soft mist inhalers (SMIs), which do not rely on hydrofluorocarbon (HFC) propellants (3,4). These inhalers have a significantly lower carbon footprint compared to traditional metered-dose inhalers (MDIs), which use HFC propellants, potent greenhouse gases. (5) Green prescribing would also involve avoiding overprescription and promoting evidence-based use of medications to prevent unnecessary production and disposal of pharmaceuticals (6).

Methodology

This small-scale quality improvement project (QIP) investigates the impact of switching patients with respiratory conditions, such as asthma and chronic obstructive pulmonary disease (COPD), to environmentally friendly inhalers for disease control.

We conducted a retrospective observational analysis of a cohort of patients who had previously switched from traditional MDIs to DPIs. Their asthma or COPD was evaluated by comparing clinical data before and after the transition to assess any variation in disease control.

Result

A total of 54 patients with asthma or chronic obstructive pulmonary disease (COPD) who had previously been using a metered-dose inhaler (MDI) and were subsequently switched to a dry powder inhaler (DPI) as part of routine clinical care, were included. The aim was to assess changes in disease control before and after the switch.
Among the 54 patients; 31 patients (57.4%) showed no change in disease control following the switch to DPI, indicating that the DPI was similarly effective to the MDI in these cases.18 patients (33.3%) demonstrated a subjective improvement in disease control after the change. 4 patients (7.4%) were reverted back to MDI due to difficulties using the DPI device, primarily related to inadequate inspiratory effort. 1 patient (1.9%) experienced worsening of disease control after the change to DPI and was also switched back to MDI.

Overall, 49 out of 54 patients (90.7%) either experienced stable or improved disease control following the inhaler switch.

Discussion

The industrialized healthcare sector is estimated to contribute approximately 4%–5% of global greenhouse gas (GHG) emissions (7). The carbon footprint of a commonly prescribed metered-dose inhaler (MDI), such as salbutamol, is estimated to be equivalent to driving a mid-sized family car for approximately 175 miles (per inhaler), whereas the equivalent dry powder inhaler (DPI) produces emissions comparable to driving only 4 miles (8).

The findings of this small study align with existing evidence in the literature, indicating that dry powder inhalers (DPIs) are as clinically effective as metered-dose inhalers (MDIs) in managing respiratory conditions (9). As such, DPIs present a viable alternative to MDIs due to their substantially lower carbon footprint while maintaining similar clinical efficacy (10.11).

Most patients can use a DPI effectively. However, certain patients may find it difficult to use a DPI, as it requires sufficient negative inspiratory pressure to function properly. This means that individuals, such as children or those with significantly compromised lung function, may not be able to use a DPI. Patient selection is therefore crucial, and it is important to ensure that patients have adequate respiratory effort using inhaler checking devices.

Additionally, patient choice would also play a major role here. Surveys indicate that patients are concerned about the environmental impact of healthcare and are generally receptive to switching their inhaler based on this (12,13). However there is also evidence suggesting that patients believe environmental factors should not influence their treatment decisions (14). Healthcare providers can support patients in selecting the most suitable inhaler by utilizing tools such as the NICE patient decision aid on inhalers and climate change (15).

One of the main challenges of green prescribing is the higher cost of greener alternatives, however, accepting these small increased costs is necessary, as the long-term environmental benefits, such as mitigating climate change, can outweigh the immediate financial impact. Another challenge is the limited awareness among healthcare professionals and patients about the environmental impact of medications and devices, highlighting the need for better education on the importance of sustainable green prescribing.

Conclusion

Green prescribing aligns with global efforts to combat climate change, offering sustainable and environmentally friendly options for maintaining high standards of patient care. It is an evolving area of healthcare that emphasizes the responsible use of resources and prescribing practices, contributing to a healthier planet and population.

We advocate for the adoption of a policy on environmental prescribing to standardize decision-making across clinical settings, thereby amplifying its impact. Healthcare has a responsibility to be environmentally sustainable, and consensus-based prescribing can play a key role in achieving this goal.

References

1. British Thoracic Society. Guidelines for the management of asthma. Thorax. 2022;77(1):1-45.
2. National Institute for Health and Care Excellence (NICE). Asthma: Diagnosis, Monitoring, and Chronic Asthma Management [NG80]. London: NICE; 2017 [updated 2020].
3. Janson C, Henderson R, Löfdahl M, Hedberg M, Sharma R, Wilkinson A. The environmental impact of inhaler use in Europe and how to reduce it. Eur Respir J. 2020;55(2):1901598.
4. NHS England. Delivering a 'Net Zero' National Health Service. NHS Long Term Plan. 2020. Available from: https://www.england.nhs.uk/greenernhs/
5. Wilkinson A, Woodcock J, Smith R. Carbon footprint of inhalers: A UK-based study. BMJ Open. 2019;9(10):e028763.
6. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. 2023. Available from: https://goldcopd.org/
7. Sustainable Development Unit. Reducing the use of natural resources in health and social care [Internet]. 2018. Available from: https://networks.sustainablehealthcare.org.uk/sites/default/files/resources/20180912_Health_and_Social_Care_NRF_web.pdf
8. Green Inhaler. Green inhalers. Available from: https://greeninhaler.org
9. Parker J. DPIs and MDIs: comparing clinical effectiveness in managing respiratory disease. J Med Ethics. 2023;49(1):92–8. doi:10.1136/medethics-2022-108388.
10. Janson C, Henderson R, Löfdahl M, et al. Carbon footprint impact of the choice of inhalers for asthma and COPD. Thorax. 2020;75(1):82–4.
11. Wilkinson A, Woodcock A. The environmental impact of inhalers for asthma: a green challenge and a golden opportunity. Br J Clin Pharmacol. 2022;88(7):3016–22.
12. Liew K, Wilkinson A. P280 How do we choose inhalers? Patient and physician perspectives on environmental, financial, and ease-of-use factors. Thorax. 2017;72:A235-7.
13. D'Ancona G, Cumella A, Renwick C. The sustainability agenda and inhaled therapy: what do patients want? Eur Respir J. 2021;58(suppl 65):PA3399.
14. The Health Foundation. Going green: what do the public think about the NHS and climate change? 2021. Available from: https://www.health.org.uk/publications/long-reads/going-green-what-do-the-public-think-about-the-nhs-and-climate-change.
15. National Institute for Health and Care Excellence (NICE). BTS, NICE and SIGN patient decision aid on asthma inhalers and climate change [Internet]. London: NICE; 2021 Available from: https://www.nice.org.uk/guidance/ng245/resources/bts-nice-and-sign-patient-decision-aid-on-asthma-inhalers-and-climate-change-pdf-13558151917