



Case report

Exacerbation of asthma due to inadvertent use of a dummy inhaler

Syed Mohammad Tariq

Department of Respiratory Medicine, Luton & Dunstable University Hospital, Lewsey Road, Luton LU4 0DZ, Bedfordshire, United Kingdom

ARTICLE INFO

Keywords:

Asthma
Beta-2 agonist
Corticosteroid
Dummy inhaler
Exacerbation

ABSTRACT

Asthma is a common airways disease. Fortunately most patients respond well to inhaled therapy. Regular use of a combination inhaler delivering corticosteroid and a long-acting beta-2 agonist, is the mainstay of treatment and allows asthmatics to live a relatively normal life. However, management of asthma depends not only on the choice of drug/inhaler but also on patient compliance and optimal inhaler technique. This report describes a patient who continued to deteriorate despite adhering to prescribed treatment and demonstrating a good inhaler technique. Unfortunately the combination inhaler she was taking inadvertently was a designated placebo device for a branded product. This error was identified and corrected only after she was admitted with an asthma attack.

1. Case report

A 42 year-old lady had suffered asthma since early childhood. She had been on salbutamol inhaler as needed and a corticosteroid inhaler twice daily. Three weeks prior to hospital admission her general practitioner (GP) had switched her to a dry powder inhaler delivering 100 mcg beclometasone dipropionate and 6 mcg formoterol fumarate dehydrate per actuation. This was done primarily to conform to the current UK asthma guidelines, which recommend a combination of inhaled corticosteroid and a long acting beta-2-agonist as maintenance therapy for asthma [1,2].

A week later she became unwell with dry cough and increasing breathlessness, and saw her general practitioner (GP). She was frequently requiring her salbutamol inhaler. Her peak expiratory flow rate (PEFR) was 250L/minute (65% predicted). She was treated with nebulised salbutamol and commenced on 40mg prednisolone daily for five days, and was advised to continue her inhalers and monitor the PEFR. She re-presented six days later to an out-of-hours GP clinic and was given a one-week course of amoxicillin 500mg three times daily for an upper respiratory tract infection. Three weeks after the change of her inhaler she again attended her GP. Her PEFR had dropped to 210L/min (54% predicted), and she was feeling worse, with no improvement in respiratory symptoms despite completing the amoxicillin course. Hence the GP referred her urgently to the hospital.

On admission her blood pressure was 112/72 mmHg, heart rate 140/minute, respiratory rate 23/minute, and oxygen saturation 98% breathing room air. She had fever of 39 °C and her throat was injected. The PEFR after 5mg nebulised salbutamol was 270L/minute. Her chest was hyper-inflated with bilateral poly-phonic wheezes. Blood tests

revealed white cell count of $11.5 \times 10^9/L$ (range 4.5–8) and C-reactive protein of 35 mcg/L (range 1–6). She was admitted and treated for an asthma attack due to acute pharyngitis. In the night of admission she required a further rescue salbutamol nebuliser, and supplemental oxygen as her arterial oxygen saturation dropped to 93%.

The next morning a respiratory physician reviewed her and asked to see her inhalers. To everyone's surprise, she had been taking a dummy inhaler, which is used routinely to teach the inhaler technique to patients. The dummy inhaler was a replica of her combination inhaler except for a statement in small print stating, 'For training purposes only, contains no active ingredient'. Hence, for the preceding three weeks she had not received any active maintenance therapy for her asthma. Despite seeing her GP twice and a junior doctor on admission, this simple yet important cause of treatment failure had been missed. Her dummy inhaler was taken away and replaced by the correct inhaler. She improved on oral corticosteroid and nebulised bronchodilator and was discharged after two days. A chest clinic review in a week was arranged post-discharge.

Further enquiry revealed that three weeks ago a community nurse after teaching her the correct inhaler technique had given her the dummy inhaler to practice her technique at home. Feedback was therefore given to the community nurse with advice not to give dummy inhalers to patients. The representative of the pharmaceutical company manufacturing the implicated inhaler and its dummy device was also informed, with suggestions to make the dummy inhaler's labeling bland with an easy to read warning that it contains no active medicine.

E-mail addresses: doc_smt@hotmail.com, syed.tariq@ldh.nhs.uk.

<https://doi.org/10.1016/j.rmcr.2018.05.012>

Received 28 April 2018; Received in revised form 8 May 2018; Accepted 9 May 2018

2213-0071/© 2018 The Author. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

2. Discussion

Adherence to therapy and self-management are crucial for long-term treatment of asthma [1,2]. Asthmatics are responsible for taking their inhalers and other medications regularly. They are also encouraged to adhere to an agreed 'Personalized Asthma Action Plan' to promote self-management [1–3]. However, healthcare professionals must ensure that optimal treatment is prescribed, and take time at each review to check the medications rather than just assuming that patients are on optimal therapy. Inhaler technique should also be checked frequently as, at times, adherence to treatment is good but inhaler technique to ensure adequate drug delivery to the airways is poor, resulting in loss of asthma control. Commonly used methods to teach the correct inhaler technique include [4–7]:

- face-to-face training
- training delivered by multi-media [computer software, digital video disk (DVD)]
- use of a technique feedback device

A recent Cochrane review concluded that all these methods lead to an improvement in inhaler technique immediately after the intervention and/or at follow-up [8]. Whatever the training method, current UK asthma guidelines recommend an assessment of inhaler technique at every review [1,2].

In general, dummy inhaler devices paired to the available inhalers are provided by pharmaceutical companies to healthcare professionals for training purposes. These dummy devices are routinely used to assess and teach inhaler technique, especially in the face-to-face training sessions [4,5].

Our patient was also taught the correct inhaler technique in a face-to-face training session. Unfortunately, despite good compliance and inhaler technique, she deteriorated partly from her sore throat and partly because she had received no active medication for three weeks while erroneously taking a dummy inhaler.

This is the first report of continuous inadvertent use of a dummy inhaler resulting in loss of asthma control and hospital admission. The lessons learned are that placebo inhalers:

- should be kept in clinics/pharmacies to check and correct the inhaler technique of patients
- may not be given to patients to practice on
- should be used for practicing in front of a healthcare professional and never to practice on their own at home

- are labelled plainly (different to their active counterparts) by the pharmaceutical companies with easy to read warnings in simple and 'jargon-free' language

Conflict of interest

None declared.

Funding

None.

Consent

Informed consent available on request.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.rmcr.2018.05.012>.

References

- [1] Asthma: Diagnosis, Monitoring and Chronic Management, NICE NG80, November 2017, <https://www.nice.org.uk/guidance/ng80>, Accessed date: 20 April 2018.
- [2] Health Improvement Scotland, BTS/SIGN British Guideline for the Management of Asthma, (2016) SIGN 153.
- [3] T.L. Gatheral, A. Rushton, D.J. Evans, C.A. Mulvaney, N.R. Halcovitch, G. Whiteley, F.J. Eccles, S. Spencer, Personalised asthma action plans for adults with asthma, *Cochrane Database Syst. Rev.* (2017), <http://dx.doi.org/10.1002/14651858.CD011859.pub2>. Review.
- [4] A.N. Purohit, P.P. Patel, A.M. Gandhi, M.K. Desai, An evaluation of impact of educational interventions on the technique of use of metered-dose inhaler by patients, *Indian J. Pharmacol.* 49 (2) (2017) 194–200, http://dx.doi.org/10.4103/ijp.IJP_608_16.
- [5] B. Murray, M. O'Neill, Supporting self-management of asthma through patient education, *Br. J. Nurs.* 27 (7) (2018) 396–401, <http://dx.doi.org/10.12968/bjon.2018.27.7.396>.
- [6] R.M. Thomas, E.R. Locke, D.M. Woo, et al., Inhaler training delivered by internet-based home videoconferencing improves technique and quality of life, *Respir. Care* 62 (11) (2017) 1412–1422, <http://dx.doi.org/10.4187/respcare.05445>.
- [7] I. Sulaiman, G. Greene, E. MacHale, et al., A randomized clinical trial of feedback on inhaler adherence and technique in patients with severe uncontrolled asthma, *Eur. Respir. J.* 51 (1) (2018) 1701126, <http://dx.doi.org/10.1183/13993003.01126-2017>.
- [8] R. Normansell, K.M. Kew, A.G. Mathioudakis, Interventions to improve inhaler technique for people with asthma, *Cochrane Database Syst. Rev.* 3 (2017) CD012286, <http://dx.doi.org/10.1002/14651858.CD012286.pub2>.