Morphine in acute chronic obstructive pulmonary disease exacerbation

Toru Kadowaki , Shuichi Yano

Pulmonary Medicine, National Hospital Organization Matsue Medical Center, Matsue, Shimane, Japan

Correspondence to

Dr Toru Kadowaki;
kadowaki.toru.tu@mail.hosp.
go.jp

Accepted 10 March 2021

DESCRIPTION

A 58-year-old man, awaiting lung transplantation, was admitted to our hospital with severe acute exacerbation of chronic obstructive pulmonary disease (COPD). He had been treated with supplemental oxygen and domiciliary nocturnal non-invasive ventilation (NIV) for several years. At admission, standard therapy including systemic corticosteroids and tazobactam/piperacillin was administered. In addition, he was initiated onto the use of inhaled tiotropium/olodaterol, and the NIV was extended to 24 hours a day. However, his dyspnoea did not improve. Morphine hydrochloride (5 mg orally) was then administered to improve the severe dyspnoea. Within 10 min of taking the oral morphine, his respiratory rate had decreased from 23/min to 13/min, and the wheezing had resolved. His dyspnoea was completely relieved 20 min after taking the oral morphine. The logged data on the NIV shortly before taking the morphine revealed tachypnoea (25/min) accompanied by intense inspiratory effort (figure 1, arrow) and below zero expiratory flow before the next inspiration (figure 1, arrow head). This denoted intrinsic positive end-expiratory pressure. Twenty minutes after taking the morphine, the logged data showed improved tachypnoea (15/min), an expiratory flow that had reached zero before expiration ended (figure 2, arrow head) and sufficient inspiratory time (figure 2, arrow). Arterial blood gas analysis was performed while breathing O₂ at 1 L/min through nasal prongs before taking oral morphine and was as follows: pH 7.31, PaCO₂ 56.3 mm Hg and PaO₂ 89 mm Hg. These values while breathing the same amount of oxygen through nasal prongs improved the next day and were as follows: pH 7.35,

Figure 2 Logged data on the non-invasive ventilation 20 min after taking the morphine showing improved tachypnoea (15/min), an expiratory flow that had reached zero before expiration ended (arrow head) and sufficient inspiratory time (arrow).

PaCO₂ 53.8 mm Hg and PaO₂ 112 mm Hg. Oral morphine 10 mg/day was continued for 8 days and then reduced to 5 mg/day for 3 days. Morphine was then discontinued safely and the patient was discharged 2 weeks after discontinuation.

Oral morphine is the most commonly prescribed opioids for dyspnoea. Opioids may have multiple mechanisms of action, including reducing ventilation and oxygen consumption, increasing sensitivity to hypercapnia, and reducing the central perception of dyspnoea and anxiety-associated dyspnoea.¹ NIV is used to provide relief from dyspnoea.² In the present case, the inspiratory and expiratory positive airway pressures were set at 12 cmH₂O and 6 cmH₂O, respectively, in the spontaneous mode. Higher pressures, which may have improved the patient's ventilation and dyspnoea, could not be tolerated because of pain and oppressive feeling by the higher pressures. The problem with opioids is that they are mostly evaluated subjectively by tools such as the symptom scale. This report highlights the advantage of using logged NIV data as an objective way of monitoring the effect of morphine in acute exacerbations of COPD, as described here.

Figure 1 Logged data on the non-invasive ventilation shortly before taking the morphine revealed tachypnoea (25/min) accompanied by intense inspiratory effort (arrow) and below zero expiratory flow before the next inspiration (arrow head).

Learning points

- ▶ The problem with opioids for refractory dyspnoea is that they are mostly evaluated subjectively by tools such as the symptom scale.
- ▶ This report highlights the advantage of using logged non-invasive ventilation data as an objective way of monitoring the effect of morphine on dyspnoea in a patient with acute exacerbations of chronic obstructive pulmonary disease.

© BMJ Publishing Group Limited 2021. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Kadowaki T, Yano S. *BMJ Case Rep* 2021;**14**:e239739. doi:10.1136/bcr-2020-239739

Contributors TK: literature search, data collection, analysis of data and manuscript preparation. SY: review of manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD

Toru Kadowaki <http://orcid.org/0000-0001-6064-4885>

REFERENCES

- 1 Mahler DA, Selecky PA, Harrod CG, *et al.* American College of Chest Physicians consensus statement on the management of dyspnea in patients with advanced lung or heart disease. *Chest* 2010;137:674–91.
- 2 Lanken PN, Terry PB, Delisser HM, *et al.* An official American Thoracic Society clinical policy statement: palliative care for patients with respiratory diseases and critical illnesses. *Am J Respir Crit Care Med* 2008;177:912–27.

Copyright 2021 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <https://www.bmj.com/company/products-services/rights-and-licensing/permissions/>
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

Customer Service

If you have any further queries about your subscription, please contact our customer services team on +44 (0) 207111 1105 or via email at support@bmj.com.

Visit casereports.bmj.com for more articles like this and to become a Fellow