

## Case report



# Near fatal asthma in the emergency department: should intubate or not?

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## Near fatal asthma in the emergency department: should intubate or not?

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## Abstract

*Near-fatal asthma (NFA) is described as acute asthma associated with a respiratory arrest or arterial carbon dioxide tension greater than 50 mmHg, with or without altered consciousness, requiring mechanical ventilation. However, intubation and mechanical ventilation, in this category of asthmatic population, is a difficult managing task, especially in an emergency context. We reported the case of 23-year-old patient suffering from acute dyspnea presenting in our emergency department (ED) with a NFA associated to a respiratory peri-arrest. Continuous nebulizers of bronchodilator therapy was successful with a good and rapid response to treatment. If intubation is an absolute indication for cardiac or respiratory arrest, it is based on clinical judgement and evolvement after aggressive and optimal therapy in NFA patients.*

## Introduction

Near-fatal asthma (NFA) is described as acute asthma associated with a respiratory arrest or arterial carbon dioxide tension greater than 50 mmHg, with or without altered consciousness, requiring mechanical ventilation. However, intubation and mechanical ventilation, in this category of asthmatic population, is a challenging task which should be kept as a last resort. We herein present a case of a NFA managed successfully, with continuous nebulizers of bronchodilator therapy, in the emergency department (ED).

## Patient and observation

A 23-year-old male presented to the ED, by his own means, for acute onset dyspnea associated to an altered mental status. He had a history of previous severe asthma exacerbation three years ago led to intensive care unit (ICU) admission, and continuous history of smoking. The first assessment of vital signs showed a patient in peri respiratory arrest: obstructed-threatening airway, peripheral cyanosis, respiratory rate = 10 breaths/min, accessory muscles use, bilateral auscultator silence, pulse oximetry = 56% on air room, blood pressure= 150/100 mmHg, heart rate = 140bpm, no signs of peripheral hypo perfusion neither obstructive shock, GCS= 6/15, blood sugar rate= 2g/l. Ventilation was immediately supported by using bag mask device for five insufflations. Subsequent management included: continuous nebulizer bronchodilator therapy, which associated  $\beta$ 2 agonists and anticholinergics agents on oxygen (6-8l/min) and systemic corticosteroid therapy (80 mg of methylprednisolone IV). As an adjunct to the first line therapy, he received a single dose of 2g Magnesium sulphate infusion and IV infusion of  $\beta$ 2 agonists 0.5mg/h. Initial blood gas analysis showed respiratory acidosis with hyperlactatemia (ph=6.80,  $\text{paCO}_2 > 115$  mmHg, lac=7.7 mmol/l). Evolvement after 15 minutes of optimal and aggressive therapy: respiratory rate= 25 breaths/min, diminish use of accessory muscles, bilateral sibilant rattles, pulse

oximetry= 100% on 8l/min oxygen, blood pressure= 120/70 mmHg, heart rate= 115bpm, and GCS= 15/15. Second blood gas analysis showed: ph=7.10,  $\text{paCO}_2 = 76$  mmHg,  $\text{paO}_2 = 128$  mmHg, lac=3.4 mmol/l,  $\text{HCO}_3 = 23$  mmol/l,  $\text{SaO}_2 = 98\%$ . Biological investigations showed leukocytosis 19940/mm<sup>3</sup> (PNN=11930/mm<sup>3</sup> and PNE=380/mm<sup>3</sup>). Chest radiography (Figure 1) showed signs of hyperinflation: heart in drop, linear ribs and narrow intercostal spaces. The patient was transferred to ICU within four hours and discharged to home at day seven with better control of his asthma.

## Discussion

In the USA, fewer than 10% of patients have exacerbations severe enough to be judged life threatening, whereas around 2-20% of patients are admitted to the ICU and 4% of patients are finally intubated and mechanically ventilated [1]. NFA has two distinctive phenotypes: the most common, responsible for 80-85% of all fatal events, is characterized by eosinophilic inflammation associated with gradual deterioration over days or weeks occurring in patients with severe and poorly controlled asthma and is slow to respond to therapy. The second phenotype, with neutrophilic inflammation, has both rapid onset and response to therapy [2].

## Conclusion

Although cardiac or respiratory arrest represents an absolute indication for intubation, in NFA patients, the decision to intubate is essentially based on clinical judgement and should be considered for patients with progressive deterioration and/or poor response to aggressive treatment and not be embarked upon lightly.

## Competing interests

The authors declare no competing interest.

## Authors' contributions

All the authors have read and agreed to the final manuscript.

## Figure

**Figure 1:** chest radiography performed after clinical stabilisation



**Figure 1:** chest radiography performed after clinical stabilisation

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