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CASE REPORT

Acute Mania as an Essential Contributor for Failed Extubation in an Asthmatic Patient: A Case Report

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ABSTRACT

Failed extubation is not uncommon in intensive care unit and are known to have high morbidity outcomes. The predictors are well-established and known to intensivist, but the complexity is to identify the contributors of these predictive factors. The failure to treat the contributing factors hampered the effort towards successful extubation. To the best of our knowledge, this is the first reported case of acute mania as the essential contributor for failed extubation. This case report illustrates on how an acute mania state prompting an exacerbation of asthmatic attack due to the physical and emotional hyperarousal that ultimately led to the failed extubation.

KEYWORDS: Mania; failed extubation; asthma; case report

INTRODUCTION

Failed extubation prevalence is as high as 15% with the mortality rate up to 43%. It also contributes to prolonged hospital stay, surged of overall costs, increase in the incidence of tracheostomy and higher morbidity rate [1]. Due to these reasons, anaesthetists try their best to prevent it by identifying and treating the modifiable risk factors expeditiously. Psychiatric disorders are not well established as a cause. Nevertheless, a natural course of mania that includes hyperarousal in cognition, emotion, behaviour and physiological aspects can ultimately lead to an acute exacerbation of asthmatic attack prompting to early reintubation [2-3]. Accurate diagnosis of mania and its treatment helped to ensure successful extubation. This case also illustrates the importance of multidisciplinary team comprises of the anaesthetist, and psychiatrist to collaborate and complement the expertise of each other so that a potential failed extubation can be identified and prevented.

CASE PRESENTATION

A 39-year-old lady who defaulted treatment for the depressive disorder was intubated for a life-threatening asthmatic attack. For the last one week, there were multiple visits to the emergency department for nebulised medication in view of the exacerbation of asthmatic attack. The mother described her as being irritable, energetic, more talkative than usual, sleeping late at night, and having spending spree for a week duration prior to the intubation. She was intubated for 21-hour duration. During this time, the sedation was gradually reduced until she was only on propofol. The propofol was discontinued at the same time she was extubated. Post extubation, she was energetic, talkative, and moving around against the rest in bed advice. Eventually, she was reintubated six hours post extubation due to recurrent acute exacerbation of bronchial asthma. During the reintubation, the SPO_2 was 85% with generalized rhonchi and generalized

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reduce of air entry. She was adequately sedated with midazolam infusion reaching 3mg per hour and propofol infusion 50mg per hour.

She was then referred to psychiatry for an anticipation of repeated failed extubation due to agitation. Based on the emergence of manic symptoms, her diagnosis was revised to bipolar disorder in manic phase with life-threatening bronchial asthma. The psychiatrist decided to stop the previous antidepressant which was Oral Escitalopram 10mg *omne nocte*, and instead started her on Oral Sodium Valproate 400mg *bis in die*, and Orally disintegrating Olanzapine 5mg *omni mane*, 10mg *omne nocte* immediately.

After two days of mood stabiliser initiation, the patient was extubated. The anaesthetist maintained the 1mg/hour midazolam infusion until 10 hours post extubation. Post extubation, she was in hypomanic phase but calmer, less energetic, and less talkative. She was able to comply with the post-extubation orders including the rest in bed advice. The extubation was successful. Epilim and Olanzapine were continued. She subsequently achieved partial remission of bipolar disorder and discharged five days later. Upon six-months follow-up in the clinic, she achieved full remission of bipolar disorder and there was no recurrent acute asthmatic attack.

DISCUSSION

Failed extubation is defined as reintubation within 72 hours after planned extubation. Among the predictors reported were upper airway obstruction, impaired clearance of secretion, respiratory failure, hypoxemia, hypercapnia, insecure airway, cardiac failure, and neurological impairment [4]. Each of these predictors has multiple factors contributing to failed extubation. It is important to identify these contributing factors so that accurate management can be delivered thus preventing the occurrence of early reintubation. As in this patient, the predictor was respiratory failure due to acute asthmatic attack. However, the acute mania is the main precipitating factor that leads to exacerbation of asthma.

Irrespective of a patient's past psychiatric history, it is vital to inquire about the current symptoms for every new episode in view it may not necessarily be related to the existing diagnosis. In Bipolar I disorder, it is not uncommon for a depressive disorder to precede the mania as in this patient's case [5]. However, the continuation of an antidepressant may worsen the manic state and thus indirectly contributes to the failure of extubation. Thus, reviewing the diagnosis can change the direction of management as a whole and ensure successful extubation.

Mania contributes to failed extubation in an asthmatic patient due to its hyperarousal state of both physical and emotional components that precipitate the respiratory failure. The intense psychophysiological activation contributes to the behaviour, cognition, mood, and physiological changes [2]. The cognitive model explained that these four aspects of our life are interconnected with each other. A change in one aspect will indirectly change the other three aspects [6]. The cognitive effects of mania are flight of ideas, unrealistic perception of one's capability, denial of realistic danger, easily distracted, poor judgement, and delusion of grandiosity [2]. These will in turn switch on the self-expansive mode and escalation of self-esteem. The person becomes intolerance towards external stimuli, and unconcerned with the aftermath of their action. They become easily irritable, too happy, and these in turn lead to behavioral events such as aggressiveness, agitation, increased motor activities, and verbosity [2]. These combinations of cognition, emotional, and behavioural hyperarousal made the discussed patient unable to follow the medical advice to rest in bed, and to reduce physical exertion. She was unconcerned about the ill consequences of her increased physical activity towards exacerbation of asthmatic attack and possibility of reintubation.

From the physiological aspect, the emotional and physical hyperarousal also activated the patient's fight or flight response mode [7]. The neurobiology hypotheses of bipolar disorder also stated that mania is condition of dopaminergic hyperactivity [8] and serotonergic hypoactivity [9]. Both monoamines are implicated in autonomic nervous system which resulted in activation of sympathetic activity [10-11]. These factors combined invoking the sympathetic nervous system and the adrenal-cortical system. The heart pumps faster to supply adequate blood supply to all the muscles and internal organs. The breathing becomes more rapid and the bronchi dilate to take in more

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oxygen. However, the hyperventilation leads to exacerbation of asthma due to hypocapnia [12-13]. Unfortunately, the arterial blood gasses pre-intubation was not taken due to the emergency condition warranted the rapid intubation. The association between emotional stress and hyperventilation is well-established [14]. A study reported that psychological triggers contributed up to 4.3% to 11.5% of the asthmatic attack [3].

The immediate management was to prevent acute agitation due to the mania and ensure successful extubation. Concomitant use of midazolam and olanzapine successfully resulted in the least repetition of tranquillisation needed and minimisation of agitation [15]. Whereas, Olanzapine in combination with Sodium Valproate is more effective in treating acute mania compared to monotherapy of either medication. This combination can successfully shorten the acute agitation period as what warranted for this patient and thus can ensure earlier extubation [16]. A study showed that midazolam is as effective as haloperidol and promethazine to tranquilize an acutely agitated patient with midazolam had an advantage for faster time to sedation [17]. Midazolam either in oral or parenteral form had long been accepted as one of the most effective rapid tranquilizers in acutely disturbed or violent psychiatric patient [15]. The recuperation of mania and resolved agitation successfully enabled her to comply with post-extubation order and prevented reintubation.

CONCLUSION

The incidence of mania contributing to failed extubation is not properly studied. There is a possibility of underreported in view of adequate sedation may calm the patient temporarily or the primary illness does not involve respiratory failure. This case illustrates the importance of an accurate and detail history of the event that contributes to the intubation because treatment of the precipitating factor is the key to successful extubation.

Conflict of Interest

Authors declare none.

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Author's contribution

Siti Nor Fadhlina Misron drafted the article for the intellectual psychiatry aspect, revised and finalised the final version of this manuscript.

Lukmanul Hakim Misron drafted the articles for the intellectual anaesthesiology aspect.

Ang Yit Chiang drafted the articles for the intellectual psychiatry aspect.

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