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# Hiccups in the Neuro-Critical Care Unit: A Symptom Less Studied?

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## ABSTRACT

**Background:** Hiccups (also referred to as “hiccoughs”) are usually a transient condition that affects almost everyone in their lifetime. However, persistent and intractable hiccups are the types which are linked with unfavorable outcomes and can also result in respiratory alkalosis in intubated patients. There is no accurate estimate of the prevalence of hiccups in the patients admitted in the neuro-ICU. The most commonly witnessed hiccups in the neuro-ICU are intractable and neurogenic in nature. In this communication, we discuss the strategy of respiratory care and pharmacological management of hiccups in an adult male post decompressive craniotomy in view of unilateral basal ganglion bleed. He suffered from persistent hiccups and was managed conservatively with intravenous Metachlorpromide 10 mg on as and when needed (SOS) basis. In conclusion, it seems that persistent and intractable hiccups as a risk factor for ventilator-associated pneumonia in patients who are intubated and mechanically ventilated should be given due attention. We encourage clinical trials in this area of critical care medicine and should also encourage more studies to analyse the effectiveness of non-pharmacological methods.

**Keywords:** Anaesthesia, Critical care, Hiccups, Mechanical ventilation, Basal ganglia.

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## What do we learn from this article?

This communication validates the importance of treating persistent and intractable hiccups in intubated patients admitted in the neuro critical care unit. Due to paucity of data and dearth of literature about the same, we encourage conducting clinical trials to analyse the effectiveness of pharmacological and non-pharmacological methods of management.

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## Introduction

Hiccups (also referred to as “hiccoughs”) are medically known as Singultus, a Latin term meaning “a gasp” or “a sob”. They are usually a transient condition that affects almost everyone in their lifetime. However, persistent and intractable hiccups are the types which are linked with unfavorable outcomes such as malnutrition, fatigue, weight loss, sleeplessness and respiratory difficulties [1,2]. They can also result in respiratory alkalosis due to hyperventilation in intubated patients [3].

The patho-physiology of hiccups include a sudden reflex contraction of the diaphragm resulting in forceful inspiration, which is arrested almost immediately by closing of the glottis, producing the characteristic “snap” sound. The afferent pathways include phrenic and vagus nerve and T6-T12 sympathetic fibers. The efferent pathway comprises of the phrenic nerve (diaphragm), the vagus nerve (larynx) and spinal nerves (accessory muscles of inspiration) [4].

Although hiccups are caused by a myriad of causes which are related to the injury and/or irritation to the neural pathways, they most frequently occur because of irritation to the stomach wall or diaphragm. Others causes include electrolyte imbalance (hyponatremia, hyperkalemia), seizures, bronchoscopy, medications (inhalational steroids, morphine and anti-psychotic drugs) [5]. There is no accurate estimate of the prevalence of persistent/intractable hiccups in the patients admitted in the neuro-ICU. Also, there is a dearth of literature on the same regarding the nature of the disease and its management. Patients with neurological disorders require intubation and mechanical ventilation for development of acute respiratory insufficiency and/or they are unable to protect their airways from obstruction due to bulbar dysfunction and impaired consciousness [6].

The most commonly witnessed hiccups in the neuro-ICU are intractable and neurogenic in nature. The neurogenic type occurs because of the involvement of the medulla oblongata and they might lead to respiratory irregularities resulting in a fatal respiratory arrest [7].

In this communication, we discuss the strategy of respiratory care and pharmacological management of hiccups in a 57-year old male admitted to our neuro-ICU post-decompressive craniectomy (in view of a subacute hemorrhage involving fronto-temporo-parietal subcortical and deep white matter and thalamus) for a unilateral basal ganglia bleed. The patient was tracheotomised at an outside hospital and was diagnosed with a chest infection subsequently. He had an episode of cardiac arrest in the triage for which CPR was given and he

revived. He was intubated and was put on ventilator support. During the stay in the ICU, the patient had persistent hiccups responding to SOS Metachlorpromide 10mg Intravenously. The development of hiccups in such a patient undergoing ventilatory support led to machine desynchronization and hemodynamic alterations. We regularly monitored the pulse oximetry and hemodynamic parameters along with institutional approach of chest physiotherapy. An ultrasound abdomen was also performed to look for any sub-diaphragmatic collection of fluid which was negative. All the steps were undertaken to stop any involuntary spasms of the diaphragm to alleviate the persistent hiccups.

Chlorpromazine, a phenothizine antipsychotic is the only medication approved by the US FDA for hiccups in adults [8], the evidence of its efficacy is based on the brief case series. Long term use of this medication in the patients such as above mentioned can lead to drowsiness, dystonic reactions and tardive dyskinesia. In absence of any guideline or institutional protocol available to help effectively treat this serious disorder, medical professionals are left with minimal options other than the use of the pharmacological management with Chlorpromazine. A Cochrane review stated that there is inadequate data to guide the treatment of persistent hiccups by either pharmacological or non-pharmacological method [9].

Appropriate ventilator settings should be strongly promoted in the treatment of hiccups in patients who are mechanically ventilated. There is literature to demonstrate that continuous positive airway pressure (CPAP) and pressure support ventilation (PSV) are used as modes to stop hiccups in such patients [3, 10]. In one study by Baraka et al., when the PIP was increased up to 30-40 cm H<sub>2</sub>O, hiccup developing during the surgical procedure immediately stopped [10]. Thus, positive pressure ventilation could be a helpful approach in the treatment of hiccups.

## Conclusion

We would like to inform that it seems persistent and intractable hiccups as a risk factor for ventilator associated pneumonia in patients who are intubated and mechanically ventilated should be given due attention. We encourage clinical trials in this area of critical care medicine. Also, non pharmacological treatment methods such as acupuncture, respiratory monitoring, chest physiotherapy and use of non sedative drugs should be studied and considered to manage patients with persistent hiccups in the ICU.

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