

Case Report

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Flapping Tremor as a Diagnostic Tool for Evaluation of Hypercapnia

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ABSTRACT

A 76 year-old woman was admitted to our hospital because of aspiration pneumonia. Four days after initiation of the antibiotic treatment, her respiratory status became to be better; however, hypoxemia was recurred with tachypnea (36 breaths/min). On physical examination, she had a hot hand and flapping tremor, but not loss of consciousness, suggesting of acute type 2 respiratory failures with the increased level of PCO₂ ranged from 15 to 30 mmHg. Accumulation of the evidence showed that the PCO₂ retention from the usual level for each patient could be assessed by physical sings. Thus, even in the modern era, general physicians can easily diagnose the rapid increase the level of PCO₂ from the prior status by using the physical findings such as hot hands, flapping tremor, and loss of consciousness as in the present case.

KEYWORDS: Flapping tremor; Hypercapnia; Hot hand.

BACKGROUND

The diagnosis of acute type 2 respiratory failure needs a multidisciplinary assessment. Among them, physical diagnosis would be a pivotal role for rapid and precise diagnosis

CASE REPORT

A 76 year-old woman was admitted to our hospital with a chief complaint of dyspnea (day 1). She had primary Sjogren's syndrome with pulmonary involvement (usual interstitial pneumonia) two years previously, and underwent home oxygen therapy for recent three months (only at effort 4 L/min). On admission, vital signs were as follows, blood pressure of 180/100 mmHg, heart rate of 120 beats/min, respiratory rate of 24 breaths/min, body temperature of 37.1°C, and SpO₂ of 84% with a 4 L/min oxygen supply *via* nasal mask. Her consciousness was clear, and physical examination showed coarse crackles in the right lung field and fine crackles in throughout the lungs. Based on the diagnosis of aspiration pneumonia, she was treated with ampicillin/sulbactam 3 g q6h, and her condition was improved even at nasal cannula of 1 L/min at day 3. However, at day 4, hypoxemia was recurred with tachypnea (36 breaths/min) together with hot hand and flapping tremor, suggesting of emergence of acute type 2 respiratory failure.

Note: To best view

1. Kindly open the pdf file in Adobe Reader XI version.
2. Please save the pdf file in your local computer.
3. To watch the video kindly install the latest adobe flash player. Click here to download: <http://get.adobe.com/flashplayer/otherversions/>



Video 1: The flapping tremor at right hand of the patient.



Video 2: The flapping tremor at right foot of the patient.

Indeed, the present case showed that the increase of PaCO₂ at day 4 from the baseline (3months before) was 20.3 mmHg, which was confirmed by the advent of hot hand and flapping tremor, but not loss of consciousness (Table 1). Thereafter, regardless of the initiation of non-invasive positive pressure ventilation, she died of acute type 2 respiratory failure at day 14.

DISCUSSION

Hypercapnia can cause hot hand, flapping tremor, and loss of consciousness with an increase of PaCO₂ from the prior status at 5 mmHg, 15 mmHg, and 30 mmHg, respectively,¹ as in the present case. Although Gross et al.¹ reported that the dif-

ferent signs of hypercapnia to the carbon dioxide were assessed by mixed venous CO₂ using Campbell and Howell rebreathing methods,² those signs were present in the cases of CO₂ narcosis using the PaCO₂ instead of mixed venous CO₂.³ Furthermore, accumulation of the evidence showed that the PCO₂ retention from the usual level for each patient could be assessed by following signs such as hot hand (≥5 Torr), a rapid bounding pulse or small pupils (≥10 Torr), engorged fundal veins or flapping tremor (≥15 Torr), confusion or drowsiness (≥30 Torr), and coma (≥50 Torr).¹⁻³ Thus, whenever physicians encounter the patients with acute type 2 respiratory failure at their initial visits, physical examination would be a clue to the diagnosis for assessing the increase from the prior status in PaCO₂.

Time	3 Months before	On admission	Day 4	Day 5
Oxygen supply	room air	nasal 4L/min	nasal 3L/min	venturimask 31%
Hot hand	-	-	+	+
Flapping tremor	-	-	+	-
Loss of consciousness	-	-	-	-
pH	7.379	7.442	7.382	7.431
pCO ₂ (mmHg)	41.4	46	61.7	52.7
pO ₂ (mmHg)	87.4	59.7	54.6	51.3
HCO ₃ ⁻ (mEq/L)	23.9	30.9	35.8	34.5

Table 1: Clinical findings at each point.

CONCLUSIONS

The presence of hot hand, flapping tremor, and loss of consciousness are useful and easy way of assessment for the elevation of PaCO₂ from the prior status.

CONFLICTS OF INTEREST: None

PATIENT CONSENT

This report has no personally identifiable information, and informed consent was obtained from the patient.

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