

# Dysgeusia in Covid-19 Patient: A Rare Cause of Hyponatremia

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## Case Report

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## ABSTRACT

**Background:** Dysgeusia is a disturbance of taste and considered one of the oral symptoms of coronavirus infection (Covid-19). Hyponatremia can be induced by excessive water drinking due to dysgeusia.

**Case report:** Thirty-two years old Indian male patient admitted to Mesaieed Hospital at Hamad Medical Corporation, Qatar. The patient was admitted during the second wave of pandemic because of mild to moderate Covid-19 pneumonia. The patient experienced cough and fever associated with hyposmia and dysgeusia, the later manifested by a bitterness sensation of tongue. The patient received medications according to the protocol, after two days of treatment his blood laboratory results showed hyponatremia (129 mmol/L) compared to the initial reading. Hyponatremia workup excluded the syndrome of inappropriate antidiuretic hormone secretion (SIADH). History revealed that the patient was drinking large amounts of water, around 4-5 liters/day because of bitterness sensation of tongue, the provisional diagnosis was dilutional hyponatremia, fluid restriction up to 1.5 liter/ day which showed dramatic improvement of his sodium blood level.

**Conclusion:** Hyponatremia is not only secondary to SIADH in Covid-19 patients, but it can be due to other etiologies. Hyponatremia due to excessive water intake as part of dysgeusia is considered an extremely rare reported case.

**Key Words:** Covid-19, Dysgeusia, Hyponatremia, Hyposmia, SARS-CoV-2.

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## INTRODUCTION

In March 2020, the World Health Organization (WHO) declared that Covid-19 infection was a pandemic, and it was considered as one of the most severe pandemics that humanity faced over time<sup>[1,2]</sup>. In most cases, viral and nonviral infections manifest with pneumonia, characterized by fever, cough, dyspnea, and bilateral interstitial infiltrates on plain chest X-ray examination<sup>[3]</sup>. Sometimes, patients with Covid-19 can present with electrolyte disturbances, like hyponatremia, which is defined by serum sodium levels less than 135 mmol/L. In many cases, this electrolytic disorder is caused by many factors<sup>[4, 5]</sup>. Hyponatremia is classified as hypovolemic, euvolemic, and hypervolemic hyponatremia, each therapeutic category approach being different from each another<sup>[2]</sup>. The most recognizable cause of hyponatremia in Covid-19 patients is the syndrome of inappropriate antidiuretic hormone secretion (SIADH), found in about 40–50% of patients with this electrolyte disequilibrium<sup>[6]</sup>. These percentages may be higher in certain conditions, such as subarachnoid haemorrhage, traumatic brain injury, or pneumonia<sup>[7]</sup>. Hyponatremia in patients with pneumonia has been associated with a higher percentage of morbidity and mortality rate, therefore,

there is an urgent need for an early diagnosis and proper management to improve the prognosis of these patients and minimize the mortality rate<sup>[2]</sup>. Literatures also reported that approximately 60% of patients with Covid-19 and watery diarrhea have moderate hyponatremia. To establish the etiology and diagnosis of hyponatremia, a careful history should be taken and proper physical examinations are required; investigations such as serum sodium level, urine sodium level, serum osmolality, urine osmolality, thyroid function tests and serum cortisol may be indicated<sup>[8]</sup>.

Loss of smell and taste (anosmia or hyposmia) or taste disturbance (dysgeusia) are now recognized to be important, often presenting symptoms of mild-to-moderate SARS-CoV-2 infection affecting, around more than 50% of patients (range 5 to 98% in different studies) with a more common in women (70%) and individuals under the age of 50<sup>[9,10]</sup>. Various hypotheses have been reported to explain the loss of olfactory receptor function, including direct infection of covid-19 virus to olfactory neurons as well as infection of sustentacular (neuronal support) cells resulting in loss of olfactory receptor-containing cilia; and local inflammation of the olfactory epithelium<sup>[11]</sup>, but no definitive explanation yet exists. It is hypothesized that

these SARS-CoV-2 antigens initiate immunoglobulin type A (IgA), that is released into saliva, tears, and mucus to control the infection but which also bind to and block olfactory receptors<sup>[12]</sup>. Altered taste sensation may be manifested in different feelings like bitterness or different tastes even without external stimuli to the tongue.

The aim of the presented article is to describe an extremely rare cause of hyponatremia happening due to excessive drinking of water by a Covid-19 infected patient, who suffered from dysgeusia manifested as bitterness of tongue.

**CASE REPORT :**

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Thirty-two years old Indian male patient admitted to Mesaieed Hospital, which is one of the Covid-19 facilities of Hamad Medical Corporation, Qatar. The patient was admitted during the second wave of pandemic because of mild to moderate Covid-19 pneumonia (Table 1). The patient experienced cough and fever associated with hyposmia and dysgeusia, dysgeusia manifested by the bitterness sensation of tongue. Vital

signs were within normal limits except for fever. Physical examination revealed a well-hydrated middle-aged gentleman, a fully conscious, and oriented person, with no focal neurological deficit. The rest of the physical examination was unremarkable. Initial laboratory results revealed lymphopenia with a mild increase in C-Reactive protein. Chest x- ray showed a typical ground glass appearance mainly on the right side. He received medication according to the protocol, and after two days of treatment his blood laboratory results showed hyponatremia compared to the initial reading (Table 1). Hyponatremia workup excluded SIADH and further hormonal investigations showed no remarkable findings. History was reviewed again with the patient, he said that he was drinking large amounts of water, around 4-5 liters/day because of the bitterness sensation of tongue. The provisional diagnosis was dilutional hyponatremia due to excessive water intake. Timely determination of the etiology of hyponatremia led to a dramatic improvement of his sodium blood level after fluid restriction to 1.5 liter/day. The patient improved and was discharged in a stable condition.

**Table 1:** Laboratory investigations for Covid-19 patient with dysgeusia and hyponatremia.

Investigation	Results	Normal range
White blood cell count	7.8	4-10 x 10 <sup>3</sup> /uL
Hemoglobin	17	13-17 g/dL
Hematocrit	43.3	40%-50%
Lymphocyte count	0.8	1-3 x 10 <sup>3</sup> /uL
Platelets	152	150-400 x 10 <sup>3</sup> /uL
Creatinine	65	62-106 umol/L
Alanine aminotransferase	79	0-41 U/L
C-Reactive protein	52.8	0-5 mg/L
Procalcitonin	0.18	<0.5 ng/mL
Lactic acid	2.3	0.5-2.2 mmol/L
PCR Covid-19	positive	Not applicable
Serum sodium	129	136-145 mmol/L
Serum osmolality	225	275-295 mmol/kg
Urine sodium	36	25-40 mEq/L
Urine osmolality	85	150-1150 mmol/kg
TSH	0.85	0.3-4 mIU/L
Serum cortisol level (AM)	357	0.3-4 mIU/L

PCR, polymerase chain reaction; TSH, thyroid stimulating hormone.

## DISCUSSION

Hyponatremia is one of the most common electrolyte disorders, which has a high prevalence of morbidity and mortality rates<sup>[13]</sup>, especially in patients suffering from Covid-19 pneumonia. The physiological control of body water level and electrolyte balance are extremely related to the hypothalamus function. When 0.5% or more of the body water is lost, we feel thirsty. The kidney can excrete about 20-28 L of water a day to control water load, and an excessive intake of water rarely causes hyponatremia<sup>[14]</sup>, provided with a significant renal function. A decrease in sodium level inhibits an antidiuretic hormone (ADH) secretion, and subsequently, the excreted amount of water via the kidney increases. In case of excessive water intake, hyponatremia develops only when the water intake amount exceeds the water excretion capacity of the kidney<sup>[15]</sup>. Many publications showed that hyponatremia is associated with prolonged hospitalization and severity, as well as mortality in a number of infectious diseases, especially Covid-19 infected patients<sup>[16,17]</sup>. Yousaf *et al.* mentioned the mechanism of hyponatremia in Covid-19 infected patients secondary to SIADH, and its pathophysiology, the hypothesis referring to increased interleukin-6 (IL-6) levels stimulating ADH release<sup>[18]</sup>. In Yousaf *et al.* case series, all three patients recovered with fluid restriction. However, it is essential to consider other possible etiologies as a cause of hyponatremia in Covid-19 patients. Hypovolemic hyponatremia should be distinguished from SIADH as these conditions employ different management guidelines and strategies, therefore, early diagnosis and management of hypovolemic hyponatremia affects morbidity and mortality<sup>[19]</sup>. In our presented case, hyponatremia is due to a dilutional one, due to water intoxication, the diagnosis was done after exclusion of SIADH as well as taking a thorough history from the patient regarding excessive water intake, therefore, hyponatremia was corrected by fluid restriction. Anosmia-hyposmia and dysgeusia are common symptoms of mild-to-moderate Covid-19 cases. They are usually but not always reversible, it can be manifested in different and distorted taste feelings, and in our patient dysgeusia felt as a bitterness of the tongue, therefore, the patients should try to overcome this sensation by frequent water drinking. We regard our presented case is extremely rare because our search for causes of hyponatremia due to altered tongue sensation and excessive water intake was not existed in Covid-19 patients.

## CONCLUSION

The pathophysiological mechanisms of hyponatremia among Covid-19 patients are multifactorial, and it is not only secondary to SIADH but can also be due to other etiologies. Hyponatremia due to excessive water intake as part of dysgeusia is considered an extremely rare reported case.

## CONFLICT OF INTEREST

There are no conflicts of interest.

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