

■ Case Report

## Attention to the differential diagnosis of Covid-19: Salmonellosis

### *Covid-19'un ayırıcı tanısına dikkat: Salmonelloz*

 Selim Gorgun\*<sup>1</sup>,  Metin Yadigaroglu<sup>2</sup>

<sup>1</sup>Samsun Training and Research Hospital, Department of Microbiology, Samsun, Turkey

<sup>2</sup>Samsun University, Faculty of Medicine, Department of Emergency Medicine, Samsun, Turkey

#### Abstract

In this case series, three patients who were hospitalized with suspected COVID-19 infection and received treatment were diagnosed with Salmonellosis and discharged with recovery. Elderly patients with pre-diagnosed COVID-19, with a history of chronic disease, and who are considered to be in the risky group are immediately hospitalized and followed up. The frequent occurrence of symptoms such as fever, cough, respiratory distress, weakness as well as nausea, vomiting, abdominal pain, and diarrhea in patients with COVID-19 pre-diagnosis, increases the importance of anamnesis and physical examination in the differential diagnosis.

**Keywords:** COVID-19, salmonellosis, enteric fever, differential diagnosis

#### Öz

Bu vaka serisinde, COVID-19 enfeksiyonu şüphesiyle hastaneye yatırılan ve tedavi gören üç hasta Salmonelloz tanısı almış ve iyileşerek taburcu edilmiştir. COVID-19 ön tanısı almış, kronik hastalık öyküsü olan ve riskli grupta olduğu düşünülen yaşlı hastalar derhal hastaneye yatırılarak takip edilmektedir. COVID-19 ön tanılı hastalarda bulantı, kusma, karın ağrısı ve ishalin yanı sıra ateş, öksürük, solunum sıkıntısı, halsizlik gibi belirtilerin sık görülmesi, ayırıcı tanıda anamnez ve fizik muayenenin önemini artırmaktadır.

**Anahtar Kelimeler:** COVID-19, salmonelloz, enterik ateş, ayırıcı tanı

Corresponding Author\*: Selim Görgün, Samsun Training and Research Hospital, Department of Microbiology, Samsun, Turkey.

Orcid: 0000-0001-5841-591X

E-mail: selimgorgun55@gmail.com

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## Introduction

Although vaccination and mutations have reduced the effectiveness of the new coronavirus (COVID-19), the disease has had a high mortality potential since its first appearance in December 2019 [1]. Although respiratory tract infection symptoms such as sore throat and cough accompanying fever are often present in the COVID-19 clinic, gastrointestinal system infection symptoms such as nausea, vomiting and diarrhea can also be seen [2]. The condition can produce characteristics comparable to the clinical signs of other infectious disease agents, and therefore the diagnosis and management can be challenging.

Salmonellosis is an infectious disease that threatens public health and can cause epidemics. Salmonella strains are gram-negative, facultative anaerobic bacilli that belong to the Enterobacteriaceae family [3]. Salmonella typhi (typhoid) and Salmonella paratyphi A, B, and C (paratyphoid) strains are the ones that cause enteric fever. The typical clinical picture manifests within 12–72 hours of consuming bacteria-contaminated foods and drinks (meat and meat products, raw eggs, unpasteurized milk, etc.) or coming into contact with people and animals carrying the disease. Common symptoms are fever, diarrhea, nausea, vomiting, and abdominal pain. Older people, infants and immunocompromised individuals are at greater risk of experiencing the symptoms more severely. Even rarely, pulmonary involvement can be seen [4]. In this case series, we report on three patients admitted to the hospital with a suspected COVID-19 infection and treated but later diagnosed with salmonellosis and discharged.

### Case I

A 90-year-old female patient with a history of congestive heart failure (CHF), hypertension (HT), and asthma was admitted to the emergency department with a sudden onset of nausea, vomiting, abdominal pain, accompanied fever, and dyspnea. Upon arrival, vital signs were documented: arterial blood pressure: 136/80 mmHg, pulse: 107/min, oxygen saturation: 78%, fever: 39.0 °C (Table 1). The physical examination revealed minimal abdominal tenderness with palpation and no defense or rebound. Other system examinations revealed no evidence of pathology. Cardiothoracic computed tomography (CT) and posterior-anterior (PA) chest X-ray revealed an increase in the cardiothoracic ratio, left ventricular dominancy, cardiomegaly, calcified atheroma plaques on the thoracic aortic wall, an increase in the anteroposterior thoracic diameter, emphysematous lung hyperinflation, and

increased pulmonary vascular distribution and coarsening. No significant pathology in the lung parenchyma was reported. These findings were interpreted to be an age-related, chronic change in the patient. The patient's laboratory findings are shown in Table 2.

**Table 1.** Vital signs of the cases

	Case-I	Case-II	Case-III
Fever (°C)	39.0	39.0	37.6
Pulse/min	107	98	88
Arterial Blood Pressure (mmHg)	136/80	90/50	110/70
O2 Saturation (%)	78	94	97

**Table 2.** Laboratory results of the cases

	Case I	Case II	Case III
Wbc (109 /l)	10.5	14.2	10.9
Neutrophil (109 /l)	9.69 (92.7%)	13.4 (94.6%)	5.8 (53.5%)
Lenfosit (109 /l)	0.3 (2.8%)	0.3 (2.29%)	3.2 (29.1%)
Hgb (gr/dl)	13.1	13.6	12.4
Htc (%)	37.7	39.7	37.2
Plt ( /mm3)	124000	220000	330000
CRP (mg/L)	89.7	189	32
AST (u/l)	43	44	28
ALT (u/l)	29	24	24
Glucose (mg/dl)	124	108	165
Urea (mg/dl)	121	53	20
Creatinine (mg/dl)	1.8	1.3	0.7
ESR ( /h)	31	29	18
Troponin-I (ng/ml)	0.445	0.430	0.356
CK-MB (ng/ml)	4.37	5.73	6.72
Fibrinogen (ng/ml)	462	452	418
Procalcitonin (ng/ml)	3.83	1.8	2.1

White blood cell: Wbc, Hemoglobin: Hgb, Hematocrit: Htc, Platelet: Plt, C reactive peptide: Crp, Aspartate Aminotransferase: Ast, Alanine Aminotransferase: Alt.

Depending on these symptoms and clinical findings, supportive treatment was initiated, a swab sample was taken, and the patient was hospitalized, considering the pre-diagnosis of COVID-19. COVID-19 was negative in two swab samples obtained for two consecutive days. The patient had a complaint of diarrhea on the first day. Therefore, in the stool examination requested on the 4th day, it was observed that the stool was macroscopically green, watery, and mucoid, occasionally bloody, and microscopic analysis revealed 1-2 erythrocytes and abundant leukocytes in the fields. No parasite cysts or eggs were found in the stool test. The occult blood test in stool was positive. The Entamoeba histolytica adhesin



test was negative. In the stool culture sent the next day, *Salmonella enteritidis* growth was detected in the bacterial identification made on the VITEK 2 (Biomérieux, France) automated system from colonies with a lactose-negative appearance on *Salmonella Shigella* (SS) agar medium. The patient was transferred to another ward, and ciprofloxacin treatment was administered according to the antibiogram tests. The patient was discharged with full recovery on the 7th day of hospitalization.

### Case II

A 70-year-old male patient with a history of HT, diabetes mellitus (DM), and coronary artery disease (CAD) was admitted to the emergency department with fever, nausea, and diarrhea. On arrival, vital signs were noted: arterial blood pressure: 90/50 mmHg, pulse: 98/min, oxygen saturation: 94%, fever: 39.0 °C (Table 1). The physical examination revealed no prominent pathological findings. The PA chest X-ray and thorax CT were interpreted as atypical concerning the infectious process and viral pneumonia. The patient's laboratory findings are shown in Table 2.

As we were in the pandemic period, it was considered that existing diarrhea and fever could be seen during COVID-19. After collecting PCR swab samples, blood cultures, urine cultures, and stool cultures, the patient was isolated and admitted to the hospital with a pre-diagnosis of COVID-19.

Supportive treatment was initiated for the patient. The PCR test was negative, whereas *Salmonella enteritidis* growth was detected in stool culture. Ciprofloxacin, found to be sensitive on the antibiogram tests, was added to the patient's treatment, and the patient was discharged with complete recovery.

### Case III

An otherwise healthy 57-year-old female patient was admitted to the emergency department with fever, nausea, vomiting, and diarrhea. Patient vital signs were noted: arterial BP: 110/70 mmHg, pulse 88/min, oxygen saturation 97%, fever: 37.6 °C (Table 1). Although auscultation revealed bibasilar rhonchi, PA chest X-ray findings were within normal limits. On the thorax CT, changes in the lower lung lobes were interpreted as having a suspicious "ground glass" appearance.

After collecting a stool culture and PCR swab sample, supportive care was initiated. A control swab was taken from the patient, whose initial PCR was negative. *Salmonella enteritidis* was detected in the stool culture of the patient whose control PCR was negative. The insulting microorganisms were found to be sensitive to Ciprofloxacin in the antibiogram. Thus

Ciprofloxacin was added to the patient's medication, and the patient was eventually discharged with a complete recovery.

### Discussion

COVID-19 can present many symptoms, including fever, respiratory distress, cough, weakness, headache, abdominal pain, nausea, vomiting, and diarrhea [5]. Advanced age and presence of additional disease are parameters that predict a serious clinical course for COVID-19 [6]. In addition, it is known that the clinical course of COVID-19 is more serious in COVID-19 patients who present with diarrhea [2]. However, despite the presence of diarrhea symptoms in our patients, COVID-19 was not detected. Further investigations revealed that diarrhea was caused by Salmonellosis. Fever, headache, rash, weakness, and abdominal pain are typical clinical signs of salmonellosis (typhoid), which can mimic the clinical features of COVID-19. Typhoid fever is transmitted by ingesting contaminated water and food with infected human feces. [7]. The subjects in this case series also had fever, fatigue, nausea, and vomiting, which may be typical of both diseases. In a study by Aleena Haqqi et al., the co-occurrence of COVID-19 and *Salmonella typhi* has been described as a significant medical issue. It has also been suggested that this situation makes the task of healthcare professionals struggling with COVID-19 even more challenging [8]. In addition, in the conditions of the pandemic, especially in developing countries, all patients may not be able to receive care at once due to limited financial and health resources. This can result in serious public health problems by increasing mortality.

### Conclusion

Patients with a history of the concomitant disease, are elderly, and have a pre-diagnosis of COVID-19 are often hospitalized and followed up. The frequent complaints such as fever, cough, respiratory distress, weakness, nausea, vomiting, abdominal pain, and diarrhea in patients with a pre-diagnosis of COVID-19 increase the importance of anamnesis and physical examination in the differential diagnosis. A detailed clinical evaluation of the patient regarding possible bacterial and viral infections is essential, especially in patients with negative PCR tests.

### Presented at a meeting

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