Detrimental Results of COVID-19 Fear to Child Health

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Abstract

The outbreak of coronavirus disease 2019 (COVID-19) and its consequences have led to fear and anxiety among individuals worldwide. The risk of coronavirus transmission frightens people more than any other health problem they face. Parents have concerns about being infected with COVID-19 and delay accessing hospitals even in an emergency which can be very detrimental to child health. Here, in this article, we would like to present eight patients delayed in admission to the hospital to draw attention to the harmful consequences of COVID-19 fear in the community. Although anxiety and fear are encouraging to take necessary precautions, exaggeration of these emotions may cause greater health problems.

Keywords
- anxiety
- COVID-19
- fear

Introduction

The World Health Organization (WHO) China Country Office was informed of cases of pneumonia of unknown etiology detected in Wuhan city on December 31, 2019. The outbreak was declared a Public Health Emergency of International Concern on January 30, 2020. In February 2020, WHO announced a name for the new coronavirus disease, coronavirus disease 2019 (COVID-19).

On March 11, 2020, the first case was officially confirmed in Turkey[1] and the WHO declared COVID-19 a pandemic, pointing to the over 118,000 cases of the coronavirus illness in over 110 countries and territories around the world and the sustained risk of further global spread. On March 12, 2020, the government announced that schools and universities in Turkey would be closed starting from March 16, 2020.[2] The first death due to coronavirus disease in Turkey occurred on March 17, 2020.[1] Thereupon, the Ministry of Health in our country has taken various precautions and made suggestions that encourage individuals to take care of their health and protect others.

The outbreak of COVID-19 and its consequences have led to fear and anxiety among individuals worldwide.[3,4] Parents have concerns about being infected with COVID-19 and delay accessing hospitals even in an emergency which can be very detrimental to child health. Here, we would like to present eight patients delayed in admission to our hospital to draw attention to the harmful consequences of COVID-19 fear in the community.

Methods

During the COVID-19 outbreak, between March 2020 and April 2020, eight patients who needed pediatric intensive care unit (PICU) had diseases that are easy to manage and require short-term hospitalization under normal conditions. It was noticed that these patients needed intensive care and/or long-term hospitalization but they were delayed in hospital admission. We conducted a retrospective chart review of patients who were positive for corona virus (SARS CoV-2) and who had a delayed presentation to the hospital due to perceived parental anxiety and fear about acquiring COVID-19 in the hospital. We conducted parental interview in a nonjudgmental way to address our concerns regarding delayed patient presentations to the hospital due to parental anxiety and fear of acquiring COVID-19 during the hospital visit.

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Table 1 Clinical characteristics of eight patients

	Sex	Age	Diagnosis	Length of PICU stay	Mechanical ventilation	MODS	Inotropic treatment	Plasma exchange	Outcome
Patient 1	Male	8 y	Complicated pneumonia	14	Yes, 4 d	3	Yes, adrenalin	No	Discharged
Patient 2	Male	11 y	Perforated appendicitis	5	No	1	No	No	Discharged
Patient 3	Female	8 y	Acute renal failure Hypovolemic shock	10	No	2	No	No	Discharged
Patient 4	Female	6 mo	Acute renal failure Hypovolemic shock	4	No	2	Yes, adrenalin	No	Discharged
Patient 5	Male	8 mo	Acute bacterial meningitis	3	No	2	No	No	Discharged
Patient 6	Female	17 y	Abnormal dysfunctional uterine bleeding Hemorrhagic shock	2	No	2	No	No	Discharged
Patient 7	Female	8 y	TAMOF septicemia	10	Yes, 5 d	3	Yes, adrenalin	Yes, 5 d	Discharged
Patient 8	Female	14 y	TAMOF following diabetic ketoacidosis	10	No	3	No	Yes, 5 d	Discharged

Abbreviations: MODS, multiple organ dysfunction syndrome; PICU, pediatric intensive care unit; TAMOF, thrombocytopenia-associated multiorgan failure.

We obtained demographic details and medical details of the patients from the medical records.

Results

Clinical Information of Eight Patients (►Table 1)

Patient 1 was an 8-month-old boy admitted to our PICU with a history of fever and respiratory distress for 5 days. His family waited for 5 days, even though they noticed his respiratory distress; because they were afraid of COVID-19 transmission. He was diagnosed with parapneumonic effusion and was intubated because of respiratory failure. Ceftriaxone was started and a right chest tube was inserted. Adrenalin infusion was initiated due to hypotension despite fluid resuscitation. Laboratory findings were as follows: white blood cell (WBC): 14.5×10^3/UL, hemoglobin: 7 g/dL, platelet (PLT) count: $407 \times 10^3/mm^3$, C-reactive protein (CRP): 173 mg/L (0–4 mg/L), creatinine: 2 mg/dL (0.3–1.2 mg/dL), blood urea nitrogen (BUN): 55 mg/dL (0–10 mg/dL), albumin: 2.1 g/dL (2.7–4.8), blood gas: pH: 7.36 (7.35–7.45), HCO_3: 13.3 mmol/L (18–23 mmol/L), PCO_2: 23.3 mm Hg (32–46 mm Hg). Methicillin resistance Staphylococcus epidermidis was identified from pleural effusion. Vancomycin was added to treatment. The patient was extubated on the 4th day of hospitalization. On the 14th day of hospitalization, his symptoms relieved and he was transferred to the pediatric service.

Patient 2 was an 11-year-old boy admitted to the hospital with a history of abdominal pain and fever for a week. Although abdominal pain persisted, his parents waited for 1 week. They thought that the cause of abdominal pain was less frightening than COVID-19 transmission and abdominal pain would go away on its own. The patient was diagnosed with perforated appendicitis through ultrasound imaging of the abdomen. He had to be hospitalized for 9 days after an appendectomy.

Patient 3 was an 8-year-old girl admitted to the PICU because of acute renal failure and sepsis. Although the patient complained of fever, vomiting, and diarrhea for 5 days, her family did not bring her to the hospital because they were concerned that COVID-19 could be transmitted from the hospital or crowd. Laboratory investigations revealed: WBC: 14.5×103/UL, hemoglobin: 12.7 g/dL, PLT: $15 \times 10^3/mm^3$, CRP: 207 mg/L (0–4 mg/L), creatinine: 4 mg/dL (0.3–1.2 mg/dL), BUN: 56 mg/dL (0–10 mg/dL), sodium: 128 mEq/L (135–143 mg/dL), phosphorus: 7 mg/dL (4.5–5.5 mg/dL), uric acid: 8.6 mg/dL ($<$ 6.1 mg/dL), prothrombin time: 16.8 seconds (10–14.7 seconds), activated partial thromboplastin time: 43.6 seconds (22–34 seconds), blood gas: pH:7.24 (7.35–7.45), HCO_3: 17 mmol/L (18–23 mmol/L), PCO_2: 39.8 mm Hg (32–46 mm Hg), lactate: 26 mg/dL (4.5–19.8 mg/dL). Rotavirus antigen was positive in stool examination. Fluid resuscitation was started. She was treated for hypovolemic shock and prerenal acute renal failure. Creatinine gradually improved and she was discharged from PICU on the 10th day of hospitalization.

Patient 4 was a 6-month-old girl with a neurological disability who had a history of poor feeding, and decreased urinary output for 6 days. Before the COVID-19 outbreak, she was followed up regularly in our hospital. If she had any complaints, her family would bring her to the hospital immediately. But this time, her family waited for 6 days because they thought the hospitals are unsafe for her and were afraid that she could not survive if she got infected with

COVID-19. She was admitted to the PICU with hypovolemic shock and acute renal failure. Laboratory investigations revealed: WBC: 9.7×103/UL, hemoglobin: 11 g/dL, PLT: $516 \times 10^3/mm^3$, creatinine: 4.3 mg/dL (0.3–1.2 mg/dL), BUN: 56 mg/dL (0–10 mg/dL), sodium: 114 mEq/L (135–143 mEq/L), potassium: 6.3 mEq/L (3.6–5.8 mEq/L), phosphorus: 12.3 mg/dL (4.5–5.5 mg/dL), uric acid: 17.3 mg/dL ($<$ 6.1 mg/dL), blood gas: pH: 6.94 (7.35–7.45), HCO_3: 6.9 mmol/L (18–23 mmol/L), PCO_2: 32 mm Hg (32–46 mm Hg). Sodium bicarbonate infusion was given due to severe metabolic acidosis. Adrenalin infusion and cefotaxime were started. On the 4th day of admission, she was transferred to pediatric service.

Patient 5 was an 8-month-old boy admitted to the PICU with septic shock and a history of fever (39.6°C) and vomiting for 3 days. Although the high fever persisted, his family waited for 3 days. Because if he was COVID-19 positive, they were afraid that he would be separated from them and they would never see him again. But they had to bring him to the hospital because they could not relieve his fever. He was diagnosed with acute bacterial meningitis. Laboratory findings were as follows: WBC: 7.9×10^3/UL, hemoglobin: 8.5 g/dL, PLT count: $195 \times 10^3/mm^3$, CRP: 294 mg/L (0–4 mg/L), cerebrospinal fluid (CSF) glucose level: 3 mg/dL (40–70 mg/dL), CSF protein level: 146 mg/dL (15–45 mg/dL), CSF lactate level: 101 mg/dL (4.5–19.8 mg/dL). *Neisseria meningitidis* was identified in CSF culture. Ceftriaxone and fluid resuscitation were initiated. He was transferred to the pediatric service on the 3rd day of hospitalization.

Patient 6 was a 17-year-old girl with dysfunctional uterine bleeding. She did not apply to the hospital despite suffering heavy uterine bleeding for a week. Her family thought that her bleeding would eventually end and they did not want to risk themselves and her by contacting the people in the hospital for this reason. However, her bleeding continued excessively and her family brought her to the hospital after she felt extremely sluggish. Her hemoglobin level was 3.5 g/dL at admission to the PICU. Red blood cell was transfused three times. Oral contraceptive (a combination of estrogen and progesterone) and iron supplements were started. Her hemoglobin level improved gradually and uterine bleeding relieved. On the 2nd day of admission, she was transferred to pediatric service.

Patient 7 was an 8-year-old girl admitted with a history of fever for 5 days. She had been given antibiotics by her mother without consulting a doctor. Her mother thought she would heal with antibiotics and was afraid that COVID-19 was transmitted to them. On the 5th day of her illness, a widespread erythematous rash developed. She was admitted to the PICU with the diagnosis of sepsis and thrombocytopenia associated multiorgan failure. She was intubated due to respiratory failure. Ceftriaxone and vancomycin were started. Adrenaline infusion was initiated due to refractory hypotension despite fluid resuscitation. Laboratory investigations revealed WBC: 5.7×10^3/UL, hemoglobin: 13.2 g/dL, PLT: 109×10^3/UL, lactate dehydrogenase: 629 U/L, aspartate aminotransferase: 71 U/L, alanine aminotransferase: 109 U/L. She underwent plasma exchange for five cycles. She was extubated on 5th day of admission. Her symptoms gradually improved. She was transferred to the pediatric service on the 10th day of hospitalization.

Patient 8 was a 14-year-old girl admitted to the PICU with a history of polyuria and polydipsia for 3 months. She was diagnosed with diabetic ketoacidosis. Her family thought it was a safer idea to bring her to the hospital after the outbreak ended. Because they were worried that hospitals could not provide convenient health care. Laboratory examinations revealed: pH 6.78 (7.35–7.45), HCO_3: 4,7 mEq/L (22–29 mEq/L), pCO_2: 16 mm Hg (35–45 mm Hg), glucose: 676 mg/dL, ketones present in the urine and blood. After the resolution of ketoacidosis, thrombocytopenia-associated multiorgan failure developed. Therapeutic plasma exchange and continuous venovenous hemodiafiltration were started. The patient received five daily cycles of plasma exchange. She was transferred from the PICU to the pediatric endocrine inpatient service on the 10th day of hospitalization.

Discussion

We would like to highlight the detrimental consequences of COVID-19 fear in the community to child health by presenting a small case series. In all cases, parents reported avoiding accessing the hospital because of fear of infection with COVID-19. This case series, for the first time in COVID-19 literature, describes the effects of anxiety related to pandemic, fear of acquiring coronavirus infection in health care setting, and consequences of the parental anxiety and fear on outcomes in their critically ill children.[5]

The COVID-19 epidemic emerged in China. After the WHO characterized COVID-19 as a pandemic, the government of Turkey took action in detecting infection and preventing spread. Some measures such as avoiding crowding, hand hygiene, school closures, social distancing, travel restrictions, quarantine, and limitation of public areas were implemented. Announcements were made on social media to encourage people to stay at home.[2] The rapid increase in the number of people infected with COVID-19 and the number of COVID-19-related deaths worldwide increases public anxiety and fear in many regions.[3,4] Information on the COVID-19 pandemic and related deaths were widely covered in all communication networks. Inaccurate or false information can trigger harmful social reactions, such as fear, anxiety, and anger.[6] In contrast, accurate and high quality of health information was found to protect mental health during the COVID-19 pandemic.[7] As a result, there is an urgency for more effective dissemination of accurate health information related to the COVID-19 epidemic and regulated by health authorities.[8] Fear gradually increased as false information and disaster scenarios circulating on social media came together. All of this increases anxiety and stress levels in healthy individuals and aggravate the symptoms of those with known psychiatric disorders.[9] The outbreak affects not only community psychology, but also frontline health care workers. One of the reasons for anxiety is that the virus does not have a known treatment or vaccine yet.

Patients and health personnel should be screened regularly for depression, anxiety, and suicidal ideation. A brief mental health screener was developed to identify probable cases of dysfunctional anxiety associated with the coronavirus by health professionals and researchers.[10,11] Studies have shown that adults with clinically significant coronavirus anxiety have elevated levels of generalized anxiety, depression, and suicidal ideation. Moreover, many of these individuals cope with their anxiety by using drugs and alcohol and show functional impairment across many domains of their life.[10,12] Those who show signs of serious mental disorders should be treated rapidly. However, it should be remembered that many emotional and behavioral changes observed in patients and health care workers may be related to the adaptation response to stress. Drug treatments should only be recommended by psychiatrists in the presence of severe mental disorders.[13]

Xiang et al[14] suggest that some methods should be considered when developing mental health strategies specifically for COVID-19 outbreak. First, multidisciplinary mental health teams established by health authorities at regional and national levels (including psychiatrists, psychiatric nurses, clinical psychologists, and other mental health workers) should deliver mental health support to patients and health workers. Second, clear communication with regular and accurate updates on the COVID-19 outbreak should be provided to both health workers and patients. Third, secure services should be established to provide psychological counseling (for example, via electronic devices or apps) for affected patients, as well as their families and members of the public. Fourth, suspected and diagnosed patients with COVID-19, as well as health professionals, should receive regular clinical screening for depression, anxiety, and suicidality by mental health workers.[14]

The COVID-19 outbreak can also cause stress and anxiety in children.[15] The main causes of children's fear of the coronavirus include their lack of information about the virus, acquiring wrong information from their peers, and overexposure to social media. It has been indicated that exposing children to frightening examples reported in the media may lead to physical, emotional, and cognitive problems due to increased anxiety.[16] Children can misinterpret what they hear and fear that they do not understand. Parents and caregivers need to be a good example for their children by managing stress with healthy lifestyle choices such as eating healthy, exercising regularly, and avoiding drugs and alcohol. Parents and clinicians should inform their children about the coronavirus, according to their level of development without getting into too much detail. Children should be encouraged to share their concerns and ask questions. It is difficult to predict how some children will respond to disasters. Since parents, teachers, and other adults see children in different situations, they need to work together to cope with the impact of the disaster on children. If children continue to be very upset or if their reactions harm their daily lives or relationships then parents should talk to a professional.[17,18]

Pediatric COVID-19 infection is relatively mild when compared with adults, and children are reported to have a better prognosis. Only rare cases of severe and fatal outcomes have been reported in pediatric series.[19,20] Multisystem inflammatory syndrome in children associated with COVID-19 including Kawasaki disease and myocarditis have been recently reported.[21,22] Most of the children were infected after exposure to an adult from the household.[23] Most children infected with COVID-19 are asymptomatic and may contribute to transmission.[20] However, children continue to get sick with infections other than COVID-19 or acute onset of chronic conditions such as cancer, endocrine disorders (e.g., diabetes), and surgical conditions (e.g., appendicitis). Everyone was afraid that hospitals would be helpless to prevent preventable deaths as their capacities were exceeded. On the other hand, people were afraid to come to the hospital fearing that they would acquire COVID-19. The risk of coronavirus transmission frightens people more than any other health problem they face. Recent studies have shown that during the pandemic of COVID-19 there is a significant reduction in applications to emergency departments for reasons other than COVID-19 infection.[24,25] Similarly, a significant reduction in pediatric emergency visits was experienced in our country, although this is difficult to measure precisely.[26] Parents are afraid to come to the hospital unless their child's symptoms worsen. The delay in hospitalization can lead to disease progression and longer hospitalizations, as in our patients. The exaggerated panic feeling of parents can negatively affect the health of children by delayed admission to the hospital.[25] Also, some families are concerned about not being able to see their children again, as their children can be quarantined if they are infected with COVID-19.

The number of patients delaying admission to the hospital due to COVID-19 fear or anxiety is uncertain as it is not systematically monitored. This small case series reflects only the tip of the iceberg. By presenting these patients, we believe that access to routine clinical care should be monitored more during outbreaks such as COVID-19. It is necessary to prevent delays in access to hospital care and to increase the high quality coordinated care provided by health care providers. The parents of our patients were educated by the committee consisting of pediatric infectious disease, child psychiatry, and social service departments, about issues associated with COVID-19 (transmission, signs and symptoms, measures, treatment) and emergencies that they had to apply to the hospital.

In conclusion, it seems that COVID-19 will continue to expand for a while in the world. So as not to be late in treating preventable health problems during periods when governments are encouraging people to stay at home, individuals and especially parents have to be convinced to avoid delay in seeking medical care when they or their child have health complaints. Also, parents should be educated about potential poor outcomes in their children related to delay in hospital care for emergency conditions as compared with those posed by COVID-19.

Conflict of Interest
None declared.

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