

Young Maternal Death Caused by COVID-19

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ABSTRACT

Maternal death refers to the death of a woman during pregnancy, during delivery, or within 42 days after the termination of pregnancy, and for any reason exaggerated by the pregnancy condition or pregnancy process regardless of the duration and location of the pregnancy. Starting on 11 March 2020 in Turkey, the COVID-19 pandemic resulted in a total of 5,638,178 confirmed cases and 51,048 deaths. Our case aged 24 years was a young mother having severe weight loss since the beginning of pregnancy because of malnutrition due to depression, smoking, and nausea. The weight loss of the patient, who was infected by COVID-19 in a short while after the last visit in family healthcare, became more severe, the general appearance became worse, and she gave preterm birth in the 30th gestational week. The cardiopulmonary arrest occurred during the delivery. Although necessary interventions were made, the patient was lost on the same day. Since it is a rare case, this case is presented together with a literature review.

Keywords: COVID-19, pandemics, maternal mortality

Introduction

Maternal death is defined as the death of a woman during pregnancy, in delivery, or within 42 days after the termination of pregnancy, and for any reason exaggerated by the pregnancy status or pregnancy process regardless of the duration and location of pregnancy (1). The mean rate of maternal death worldwide was 211/100,000 in the year 2017. In Turkey, the maternal death rate was 15.4 /100.000 live births in the year 2012 but decreased to 13.7 in the year

2015 and 14.6 in the year 2017 (1,2,3). Maternal death may occur due to direct or indirect factors (1). Deaths by COVID-19 infection should be considered within the scope of indirect maternal deaths.

In the present case presentation, a COVID-19 infection coursing with severe pneumonia and causing the death of mother and baby is presented together with literature.

The informed consent form was obtained from the patient's family.

Date of submission: 24.04.2021 / **Date of acceptance:** 02.08.2021

How to cite: Kucuk IG, Aladag E. Young maternal death caused by COVID-19. Euras J Fam Med 2021;10(3):158-62. doi:10.33880/ejfm.2021100307.

Conflict of interest: No conflict of interest was declared by the authors.

Financial disclosure: No financial disclosure was declared by the authors.

Case

The 24-year-old patient applied to family medicine polyclinic in the 7th gestational week, body weight (BW) was 46 kg. Laboratory findings were; Red Blood Cell Count (RBC): 4.22×10^6 mL, Hemoglobin (Hb): 13.3 mg/dL, Hematocrit (Htc): 38.4%, Glucose: 61 mg/dL. Her blood type was 0 Rh (+) and that of her spouse was A Rh (-). She was receiving iron therapy. The second visit was in the 18th gestational week and BW was 42 kg. Laboratory findings were RBC: 3.99×10^6 mL, Hb: 12.1 mg/dL, Htc: 30.5%, Glucose: 53 mg/dL, Thyroid-stimulating hormone (TSH): 2 mIU/mL, Free thyroxine (fT4): 0.63 ng/dL. She stated that she was subjected to domestic violence. The case was referred to internal medicine and endocrinology polyclinics due to nausea and weight loss but it was determined that she had never applied to the hospital.

The patient, who has moved to her parent's house because of problems with her spouse, changed her family physician. The new family physician was referred to the department of psychiatry with the diagnosis of depression due to timidity, severe weight loss, loss of appetite, and not clearly responding to questions. However, the patient refused to go to psychiatry. In the third visit in the 27th gestational week, BW was 39 kg, blood pressure couldn't be measured, and heart rate was 55/min. Laboratory findings were RBC: 4.32×10^6 mL, Hb: 13.8 mg/dL, Hct: 39.2%, Red Cell Distribution Width (RDW): 15%. No fetal heart rate could be detected in handheld Doppler. Then, the patient was referred to the emergency gynecology unit, but the patient was

rejected. The oral glucose tolerance test (OGTT), which should be performed in the 28th gestational week, was not performed upon her request.

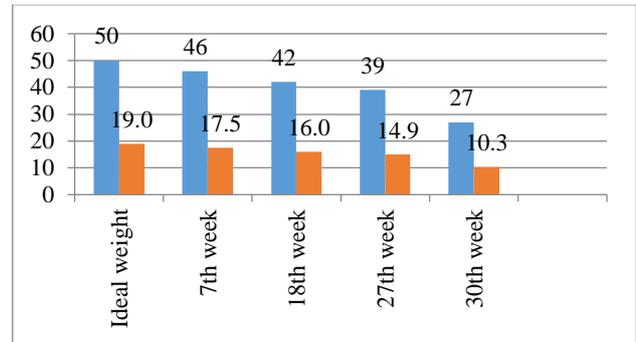
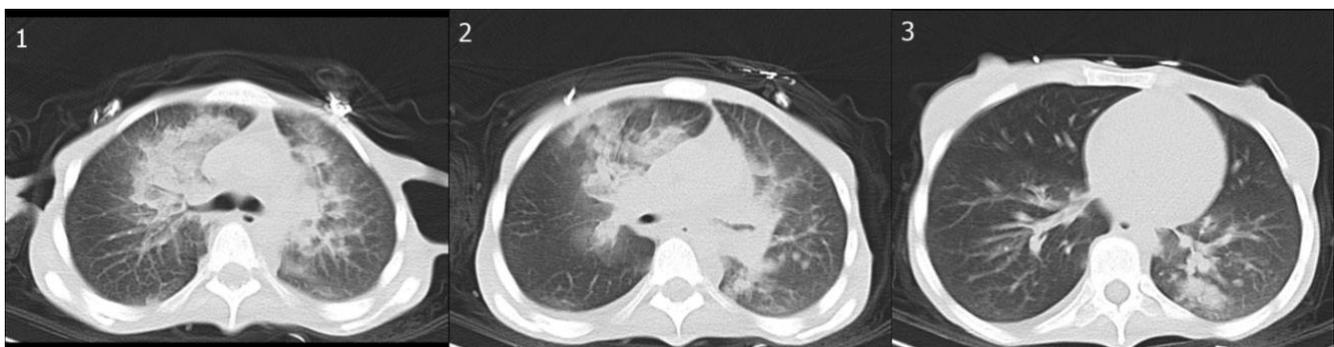


Figure 1. Patient's ideal and observed body weights and body mass indexes

Approximately 3 weeks after the last visit, she was taken by ambulance in 30th gestational week due to respiratory failure and low saturation but she had cardiopulmonary arrest and was resuscitated with cardiopulmonary resuscitation (CPR). In the intervention performed in gynecology emergency service, it was observed that the head of a neonate was out of the vagina and was dead. The neonate was weighing approximately 1000 g and was male. The BW of the patient was 27 kg. It was determined that she lost 19 kg since the beginning of pregnancy and 12 kg in the last 3 weeks. In Thoracic Computed Tomography (CT) taken due to saturation levels fluctuating around 60% and bad overall appearance, consolidation, ground-glass density, tree-in-bud pattern, and peri-bronchial thickenings were observed in both lung parenchyma (more remarkable at higher zones) and the case was considered to be COVID-19 pneumonia (Images 1-3).



Images 1,2,3. Ground glass density, tree-in-bud pattern, and peri-bronchial thickening in both lung parenchyma, respectively.

The overall status of the patient was bad; she was unconscious, and saturation decreased to 50%. Thus, the patient was intubated and taken to mechanical ventilation. Laboratory findings were White blood cell (WBC): 5.14×10^3 mL, Hb: 14.8 mg/dL, Htc: 43.5%, Platelet (PLT): 61.000/mm³, ferritin: 1029.9 mg/L, D-Dimer: 4281 ng/mL, Lactate dehydrogenase (LDH): 611 U/L, C-reactive protein (CRP): 15 mg/L, Aspartate Aminotransferase (AST): 348 U/L, Alanine Aminotransferase (ALT): 189 U/L, Gama Glutamyl Transferase (GGT): 113 IU/L, Troponin I: 2.655 g/mL, Creatine Kinase Muscle and Brain (CK-MB): 85.3 U/L, and Na: 131 mmol/L. The result of the COVID-19 PCR test performed using a nasopharyngeal swab was negative. The patient's Thoracic CT, laboratory findings, and clinic complied with COVID-19. The patient was given 4 units of thrombocyte infusion and immune plasma due to the low thrombocyte count. The patient, who couldn't be given favipiravir since her BW was lower than 50 kg, was given IV immunoglobulin (IVIG) treatment. The patient was given Piperacillin/Tazobactam as antibiotic therapy. Since the patient coursed bradycardic and then no blood pressure and heart rate could be measured, the patient was given a positive inotropic agent and fluid support. The patient did not respond to treatment and CPR was applied. The patient, who didn't respond to CPR, was recorded as exitus. The cause of death was recorded as multiple organ failure and poor general condition related to COVID-19.

Discussion

Depression is widely seen during and after pregnancy. In pregnancy, depression is related to various negative outcomes for both mother and fetus (4,5). According to DSM-V, one of the diagnostic criteria for depression is significant weight loss without dieting (6). She was 4 kg less than her ideal weight even at the beginning of pregnancy and she lost 19 kg during the pregnancy period. She lost 12 kg in the last 3 weeks before she died. Body Mass Index was 19 at the beginning of pregnancy and decreased to 10.3 in the 30th gestational week. This severe weight loss

is believed to have significantly contributed to immune system disorder and the death of the mother.

Smoking or second-hand smoking might cause severe problems for the mother and fetus. The decrease in immunologic responses in pregnant smokers increases the incidence of viral and bacterial infection and, thus, preterm birth might be triggered (7). Active smoking might have triggered the preterm birth and increased the risk of COVID-19 infection in the present case.

Nausea and vomiting are observed in 50-80% of pregnancies. Nausea and vomiting beginning in the 5th gestational week generally end or significantly decrease at the end of the 16th week. It has various reasons. Pregnant women with nausea and vomiting complaints need social support of spouse and family (8). The authors believe that depressive mood and lack of social support might play a role in vomiting continuing throughout the pregnancy. Various complications such as dehydration, electrolyte disturbances, hemoconcentration, rapid loss of weight, malnutrition, etc. may develop in patients with vomiting and nausea (9). The present case had weight loss, electrolyte disturbances, and hemoconcentration.

Angiotensin-converting enzyme II (ACE2) receptor is used in the entrance of SARS COV-2 into the cells, transmembrane serine protease 2 (TMPRSS2) receptors are used in the successful infection process. Both receptors are coexpressed in placental development stages. Therefore, the placenta also carries a risk for this virus (10,11). Due to the effects of the virus on the placenta; fetal infection, fetal growth retardation, congenital anomalies, and fetal losses can be observed (12). COVID-19 couldn't be detected in the nasopharyngeal swab sample taken from our patient. However, COVID-19 infection was detected in samples taken from the placental and umbilical cord during the autopsy. Pregnant women are more sensitive to COVID-19 infection and their risk of severe COVID-19 and the thromboembolic event is higher than in the rest of society. In relationship with COVID-19 infection, the preeclampsia, maternal death, preterm birth, and cesarean risks of pregnant women increase. In

pregnant women infected by COVID-19 in late pregnancy (after 24th gestational week), fetal distress, fetal growth limitation, pre-eclampsia, preterm birth (nearly %50), and perinatal mortality rates increase (13,14). Preterm birth occurred in the present case. The mortality rate is 12.7% in pregnant women with COVID-19 infection but it increased to 22.6% in severe infection and 64% for those in mechanical ventilation (13). From the moment of her application to the hospital, the present case was given oxygen support in the intensive care unit and mechanically ventilated immediately.

The authors believe that a team incorporating family physicians, psychologists, and psychiatrists might be very helpful in planning the treatment.

Conclusion

COVID-19 infection causes severe complications and increased mortality in pregnant women and susceptible groups. Risk assessment should be performed for those planning a pregnancy and/or pregnant women. The conditions that might increase the mortality and morbidity in pregnancy and COVID-19 infection should be eliminated. Appropriate treatment should be selected with a multidisciplinary (e.g. family physician, psychology, and psychiatrist) approach. In the present case, appropriate risk assessment and treatment of these conditions were not performed, COVID-19 infection was detected late, and she didn't respond to treatments.

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