



Case report

An asthmatic pregnant woman with COVID-19: A case report study

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ABSTRACT

Background: COVID-19 represents with various clinical symptoms and infects the respiratory tract, throat, nose, and lung involvement can lead to severe lung disease and death., among asthmatic patients, infections can lead to deterioration. The severity, and prognosis of this disease are likely to be devastated in pregnant women with underlying diseases such as asthma.

Case presentation: We present an Asthmatic pregnant woman who infected with SARS-CoV-2 admitted to two hospitals in Iran. The patient's symptoms were dry coughs, dyspnea, and inability to speak, numbness, and fatigue. The initial examination indicated a body temperature of 37.9 °C, oxygen saturation (SPO2) 91%, partial pressure of oxygen (Pao2) was 25 mm Hg, respiratory rate (RR) of 20 breaths/minute (b/m), blood pressure of 100/60 mmHg, and pulse of 80 bpm (beat/minute) and fetal heart rate (FHR) = 167/min. The pregnancy terminated by Caesarean Section (C/S) due to fetal tachycardia, a healthy baby with normal range. Anthropometric characteristics were born. Our case had leukopenia and also revealed, elevated C-reactive protein and erythrocyte sedimentation rate. Our case received supportive care and antibiotic & antiviral therapy and was discharged within 8 days with a good general condition.

Conclusions: The patient's condition improved after 8 days of hospitalization and the patient underwent appropriate clinical outcome in spite of underlying disease and infection with SARS-CoV-2

1. Introduction

Since from first prevalence of Coronavirus in Wuhan, China, which is labelled as COVID-19. Thousands of people were infected with this virus in the world [1]. The disease represents with various clinical symptoms and infects the respiratory tract, throat, nose, and lung involvement can lead to severe lung disease and death, among patients with underlying diseases, infections can lead to deterioration conditions [2]. Due to WHO reports those with asthma and other long-term lung diseases are more likely at risk from COVID-19 [3]. Furthermore, currently, it is believed that pregnant women are generally susceptible to COVID-19.

There are limited data about the coronavirus infection in pregnant

women with underlying diseases. Obviously, if a pregnant woman has an underlying condition such as asthma, infection with the COVID-19 becomes increasingly important. We believe reporting a case of the outcomes and management of the asthmatic pregnant woman with COVID-19 from Iran may be of interest to those involved in providing care for pregnant women and other clinicians.

1.1. Case Presentation

A 32-year-old pregnant woman (G₁, P₀, Ab₀) with asthma, in the 35st week of pregnancy (35 w +5 day) referred to shahid Kamali medical center (Obstetrics and Gynecology Hospital), Karaj, Iran on March 19,

Abbreviations: SARA, Severe Acute Respiratory Syndrome; PaO₂, Partial Pressure of Oxygen; SpO₂, Percentage of Oxygen Saturation; FHR, Fetal Heart Rate; C/S, Caesarean Section; BMI, Body Mass Index; NST, Non-Stress Test; RT-PCR, Reverse Transcription Poly Mearas Chain; CT, Computed Tomography; PROM, Premature Rapture of Membrane; RR, Respiratory Rate; NPO, Non-Per Oral; IP, Interstitial Pneumonia; ESR, Erythrocyte Sedimentation Rate; ARDS, Acute Respiratory Distress Syndrome; bpm, beat per minute.

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2020. This patient symptoms were dyspnea and dry cough. The patient had been suffering from asthma since childhood, and the patient's asthma symptoms worsened during pregnancy (22nd weeks of gestational). The patient used salbutamol spray to control her asthma. BMI (Body mass index) was 26 (Height = 164, weight = 71).

The patient also has a history of visited a general practitioner with symptoms of otalgia, sore throat and tooth abscess on March 9, 2020 and she was prescribed Co-amoxiclav, metronidazole, acetaminophen. And about 4 days later (march 13, 2020), the patient's condition worsened and coughs, dyspnea, and inability to speak, numbness, and fatigue were appeared, and finally the patient referred to shahid Kamali medical center on March 19, 2020. The initial examination indicated a body temperature of 37.9 °C, oxygen saturation (SPO2) 91%, Partial pressure of oxygen (Pao2) was 25 mm Hg, respiratory rate of 20 breaths/minute, blood pressure of 100/60 mmHg, and pulse of 80 bpm and FHR = 167/min, the vital sign and examination results was shown in [Table 1](#)

She was admitted to the intensive care unit, where she began treatment with amoxiclav, metronidazole, acetaminophen, beclomethasone spray, and oxygen therapy, fetal health was assessed by NST (non-stress test).

In this patient, the suspicion of COVID-19 was strengthened due to its prevalence in Iran, especially the red situation in Karaj. Furthermore, based on family history in our case, there was colds symptoms and sore throats in the patient's mother on the date February 19, 2020. She was asked to undergo RT-PCR (Revers Transcription-Poly meras chain reaction) test and chest computed tomography (CT) scans. RT-PCR test was done by nasopharyngeal swabs. The chest CT showed multiple infiltrations in both lungs, consistent with COVID-19. Then, the patient transportation to Imam Ali Hospital (specialty hospital) and admitted to

Table 1
The vital sign & laboratory results.

Date:29/12/98	Result	Normal Range
Vital Sign		
Temperature	37.9	35.37–37.35
Pulse Rate (PR)/bpm	80	80–90
Respiratory Rate (RR)/bm	20	8–24
Blood Pressure (BP)	100/60	100/60–140/90
Blood Gas Analysis (On air room)		
Pao2 (mmHg)	25 (Low)	41–51
SPO2	91% (Low)	>93%
Pco2	31.1 (Low)	35–40
PH (mm/Hg)	7.39	7.31–7.41
Hco3	18.4 (Low)	22–26
Hematology		
BG&RH		
PT	15.4 (High)	10–13
PTT	26.2	24.2–36.3
INR	1.5	0.9–1.3
Fibrinogen	285	200–450
ESR (mm/h)	101(High)	0–20
WBC (*10 ³ /mm ³)	10.78*10 ³ (High)	10–14*10 ³
RBC	3.92 (Low)	4.2–5.2
HB (gr/dl)	10.6 (Low)	12–16
HCT (%)	30% (Low)	>33%
MCV (fl)	76.5 (Low)	77–97
MCH (pgm)	27	27–32
Platelet (*1000/mm ³)	301	150–450
PDW(FL)	8.4 (Low)	10–17
MPV(FL)	8.8	8–12.5
P-LCR (%)	15.9 (Low)	17–45
Biochemistry		
VitD ₃ (ng/ml)	24.28	30–70
Creatinine (mg/dl)	0.67	0.6–1.2
CPR (Creatine Kinase)	39U/I	24–70
Total Bill	0.46	0.1–1.1
Direct Bill	0.23mg/dl	≤0.3
LDH - P (Lactate Dehydrogenase test) U/I	492.8	230–500
Fetal Heart Rate (FHR)	167	101/60

the high-risk maternity ward.

Due to premature rupture of membrane (PROM) and fetal tachycardia (FHR = 167), The patient underwent emergency cesarean section with spinal anesthesia at 36 weeks of gestation on 20 March.

A healthy neonate (male) was born. The neonate weighed 2600 g, heighted 49 cm, and head circumflex was 33cm, the appgar scores at 1 min and 5 min after birth were 9 and 10, respectively. The neonate received 1 mg of vitamin K. After the baby was born, it was separated from the mother and fed with formula, and her mother was hospitalized in the high-risk maternal ward until March 27, 2020. The percentage of oxygen saturation and vital signs and other symptom during hospitalization is presented in [Table 2](#).

During his stay in the high-risk maternity ward of Imam Ali hospital in Karaj, the patient was prescribed ad follow:

Amp cefepime 1–2 g IV q8-12hr for 7–10 days.

Amp Apotel 1 gr.

Hydroxychloroquine 200mg/OP/day.

Tab Fe 30mg/daily/PO.

Tab Kaletra (lopinavir–ritonavir) 400 mg and 100 mg/BD.

Amp dexamethasone I/day.

O2 therapy (mask): 8lit/min.

On March 23, 2020, the patient's condition worsened on the five day of hospitalization, and she developed tachypnea (RR = 45 bm). In consultation with Infectious disease specialist and Psychiatrist, the stress was diagnosed and the patient was given.

Tab Vit C I/daily/PO.

Tab B Complex I/daily/PO.

Amp Enoxaparin (Lonenox) 4000/SC.

Tab Chlordiazepoxide 5 mg/BID.

Tab Sertraline 50mg ½ tab for one week then 1 tab.

Due to continuation of stress in patient, Trifluoperazine tablets have been added to patient medication regime. During her hospital stay at Imam Ali Hospital and after the starting of feeding at the end of the NPO, the patient's diet was high in protein. Patient sleep was enough. The patient's vaginal bleeding was normal and the patient also had normal intake/output.

Stable condition was reported on March 25, 2020 and on March 26, 2020 The patient was discharged from the hospital and was recommended to stay in home quarantine for 14 days and newborn should be fed with formula.

2. Discussion

A case was 32 years old woman infected by COVID-19 had a relatively long course of asthma from her birth. Asthma is one of the underlying diseases can predispose a person to COVID-19 [4]. On the other hand, many pregnant women suffer from shortness of breath during pregnancy [5], which alongside asthma, it can worsen the consequences of COVID-19. In the present case, the patient had a history of dry cough and sore throat, lived in Karaj and had CT findings of viral pneumonia, which was the suspected case, the average time from first symptom in our case to admission to hospital was 10 years. Other studies presented the 10–14 days as incubation period of COVID-19 [6].

Despite various evidence regarding the efficacy of high-flow oxygen therapy in the management of acute respiratory failure and also has applications in cases with acute exacerbation of interstitial pneumonia (IP) [7–9], our case condition was improved with normal flow of oxygen therapy. In another case reported with COVID-19 from china, the patient condition was improved with high-flow oxygen (15 L/minute) [6]. It seems to be related to the patient's condition, so that in Wang's case, the patient has AIDS besides COVID-19 and his CD4 levels was low.

Consistent to wang report, our results represented that, the patient had lower lymphocytes and elevated CRP levels, which were consistent with viral infection. Due to wang study, COVID-19 was diagnosed by the positive results of the ORF1ab gene of COVID-19 from a nasopharyngeal swab and specific antibodies in his serum. We didn't assessed antibodies

Table 2

The percentage of oxygen saturation and vital signs and other symptom during hospitalization.

Date	T	RR	PR	BP	SpO2 + Oxygen therapy	Awareness and ability to speak	Shortness of breath and wheezing	nausea and vomiting
March 19, 2020	37.9	80	20	100/60	94%	–	+	–
March 20, 2020	37.2	76	16	100/60	96%	–	+	–
March 21, 2020	37.2	78	18	100/65	95%	+	+	–
March 22, 2020	37.3	87	22	100/60	92%	+	+	–
March 23, 2020	37.9	85	45	100/60	96%	+	+	–
March 24, 2020	37	89	23	100/60	93%	+	–	–
March 25, 2020	36.8	72	24	110/60	94%	+	–	–
March 26, 2020	The Patient Discharged							

in our case.

Laboratory examination revealed slight elevations in white blood cell count (10.78*10³), ESR (Erythrocyte sedimentation rate (101 mm/h) which were consistent with viral infection.

After transportation to a specialty hospital, our case treated with Tab Kalettra. Based on the evidences, Kalettra has effective influences on reduction of the risk of adverse clinical outcome such as ARDS (Acute Respiratory Distress Syndrome) or death and viral load among patient with SARS [10].

Due to Barnes report [11], and due to the increased risk of thrombosis in patients with COVID-19 during hospitalization, the use of anticoagulants such as Enoxaparin (Lonenox) 4000/SC has been considered in our case. Hydroxychloroquine was other medication in our case, in this regard, the evidence suggests that the antiviral properties of hydrochlorothiazide [12,13].

3. Conclusion

The patient's condition improved after 8 days of hospitalization; and the patient underwent appropriate clinical outcome in spite of underlying disease and infection with COVID-19.

Covid-19 infection in pregnant patients with asthma can be safe with careful medical and nursing care.

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Availability of data and materials

All datasets in this study are available in reasonable request.

Authors' contributions

ASH: Managed the case as team and who was presented the case, **AP:** contributed in Case presentation, **SE,** participated in writing the manuscript, **LS:** writhed the manuscript. All authors have read and approved the manuscript.

Ethics approval and consent to participate

The Ethics Committee of Alborz University of Medical Sciences approved the study (IR.ABZUMS.REC.1399.068).

Consent section

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Consent for publication

Not applicable.

Declaration of competing interest

Authors declared, there isn't any conflict of interest.

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