

## Case Report

# Successful outcome of a severe COVID-19 patient with multiple co-morbidities: a case report

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### ABSTRACT

*Patients with severe form of corona virus disease 2019 (COVID-19) with multiple co-morbidities can be treated successfully. We report a case of COVID-19 pneumonia complicated by acute respiratory distress syndrome (ARDS), occurring in an elderly male patient with (co-morbid) diabetes mellitus, hypertension, chronic kidney disease and obstructive sleep apnea. This case is reported to emphasize that managing severe COVID-19 patient with multi-disciplinary approach, keeping in mind each of the co-morbidities, can result a favorable outcome.*

**Key words:** ARDS, comorbidity, COVID-19, outcome.

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### INTRODUCTION

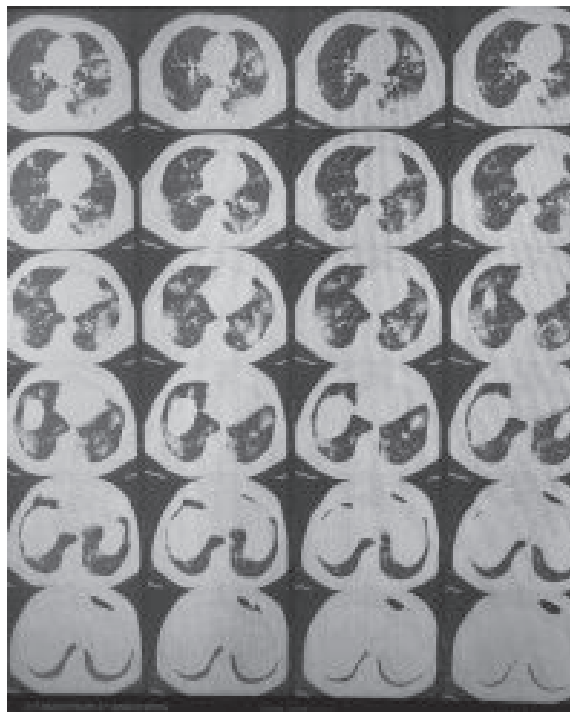
Intensive care units across the world are over-burdened by the number of patients with acute respiratory distress syndrome (ARDS) as the coronavirus disease of 2019 (COVID-19) pandemic struck.<sup>1</sup> Multiple co-morbidity attribute to worsening outcome in COVID-19 infection. Among them, diabetes mellitus and obesity play a vital role on the mortality rate from COVID pneumonia.<sup>2</sup> We report the case of a 66-year-old diabetic, hypertensive, obese male who is a diagnosed case of sleep apnea and chronic kidney disease. His COVID pneumonia was complicated by ARDS and was successfully treated with antiviral, antibiotics, high dose steroids and high flow oxygen.

### CASE REPORT

A 66-year-old hypertensive, newly detected diabetic, obese, known chronic kidney disease and obstructive sleep apnea patient tested positive by reverse transcriptase polymerase chain reaction (RT-PCR) for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Initially he had mild symptoms and was treated at home with favipiravir, doxycycline, low molecular weight heparin and other supportive medications. His two other

family members were also positive for SARS-CoV-2 before him with mild symptoms.

Prior admission he did high resolution computed tomography (HRCT) scan of chest which revealed multiple ground glass density involving 40% of lung volume (Figure 1).



**Figure 1** High resolution computed tomography (HRCT) scan of chest showing multiple ground glass density involving 40% of lung volume

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He presented to hospital with severe shortness of breath, cough and extreme fatigue on 9<sup>th</sup> day of his symptom onset. Shortness of breath was more on lying on left lateral position and even with minimum exertion like changing sides on the bed. The cough was non-productive, exaggerated on lying flat and relieved somewhat by taking bronchodilator inhalers. His fatigue was so extreme, hampering his day to day activities like changing dress, bathing or going to toilet.

The patient was moderately anemic and afebrile. Physical examination revealed the following vital signs: temperature 98.6°F, heart rate 94 beats per minute, blood pressure 160/100 mmHg, respiratory rate 36 breaths per minute and oxygen saturation 91% with 12.0 L oxygen in non-rebreather mask (NRB), GCS- 14/15.

His laboratory test revealed C reactive protein of 131.7 mg/l, serum ferritin of 784 ng/ml, D-dimer level of 1.13 mg/L (upto 0.55), lactate dehydrogenase of 633 U/L, His complete blood count showed high neutrophil-to-lymphocyte ratio (neutrophil 88%, lymphocyte 9%)

After admission in hospital his chest x-ray (Figure 2) worsened showing bilateral patchy opacities involving his lung fields and he developed ARDS. He was placed on high flow nasal oxygen with a flow of 50 L per minutes and a FiO<sub>2</sub> of 90% within 3 hours of his admission. ECG showed sinus tachycardia, otherwise unremarkable. All other laboratory findings are given in Table I.



**Figure 2** Chest X-ray P/A view showing diffuse bilateral pulmonary infiltrates (sitting)

He received intravenous (IV) remdesivir, IV methylprednisolone, IV meropenem, IV linezolid. Two units of convalescent plasma were given in 2 days. Both short acting and long-acting insulin analogue were started as his random blood sugar was found 23.7 mmol/L. He was on high flow nasal cannula (HFNC) with 50

**Table I** Laboratory parameters of the patient with severe COVID-19

	1 <sup>st</sup> day	9 <sup>th</sup> day	11 <sup>th</sup> day	21 <sup>st</sup> day
Hb	11.7 gm/dl	10.5 gm/dl		7.5 gm/dl
TC of WBC	22,170 cmm	18,240 cmm		5,570 cmm
Neutrophils	89.6 %	94.3%		84.4%
Lymphocytes	3.7 %	1.9%		9.9%
Monocytes	0.9 %	2.6%		2.3%
Eosinophils	0.0 %	0.0%		3.2%
Platelets	2,41,000 cmm	55,000 cmm		43,000 cmm
ESR	48 mm in 1 <sup>st</sup> hour			
S. creatinine	1.4 mg/dl	1.2 mg/dl	1.2 mg/dl	1.8 mg/dl
S. ferritin	784 ng/ml	847 ng/ml		588 ng/ml
CRP	22.3 mg/L	9.8 mg/L		
D- dimer	1.13 mg/L	0.61 mg/L		
S. Na+	140 mmol/l		121 mmol/l	138 mmol/l
S. K+	3.3 mmol/l		3.79 mmol/l	3.9 mmol/l
S. albumin			2.0 gm/dl	2.87 gm/dl

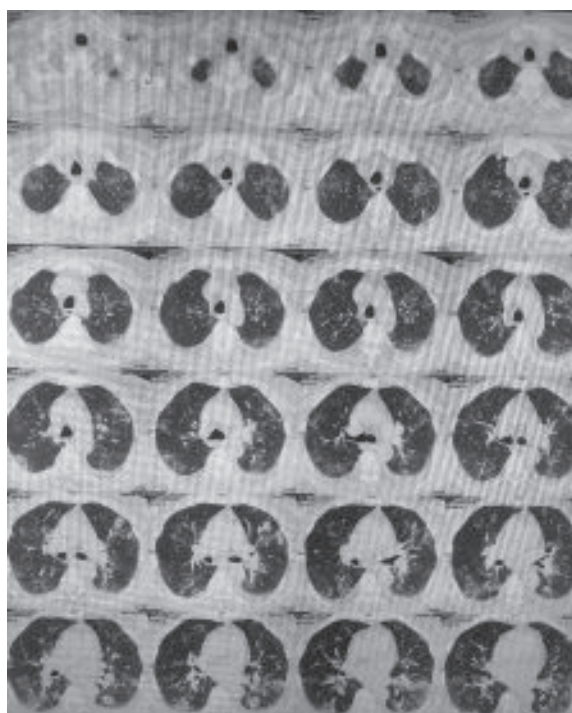
L oxygen at FiO<sub>2</sub> 90% initially and gradually reduced to 30L at 35% on day 8. He was switched to oral antibiotics, steroids and 3L oxygen in nasal cannula on day 9. Chest x-ray showed significant improvement (Figure 3).



**Figure 3** Chest X-ray P/A view showing improvement since admission (sitting)

But patient developed swelling of eye lids, legs, and abdomen on 11<sup>th</sup> day and lab reports revealed serum alanine aminotransferase 43 U/L, serum aspartate aminotransferase 30 U/L, serum albumin 2.0 g/dl, serum creatinine of 1.2 mg/dl, serum sodium 121 mmol/L, serum potassium 3.7 mmol/L, serum ferritin 847 mg/L. IV albumin was given for 5 days. His body swelling improved.

On day 19, patient complained of increasing fatigue and his CBC revealed thrombocytopenia (platelets 43,000/cmm), anemia (hemoglobin 7.5 gm/dl). One unit red cell concentrate was transfused. HRCT scan of chest was repeated on 23<sup>rd</sup> day of hospital admission which revealed 60-65 % involvement (Figure 4). As patient was maintaining oxygen saturation of 96-98% in ambient air, he was discharged on day 22.



**Figure 4** High resolution computed tomography (HRCT) scan of chest showing fibrous bands with multiple ground glass density involving 60-65% of lung volume

## DISCUSSION

Our case report showed successful outcome of an aged, co-morbid patient of COVID pneumonia complicated by ARDS, anemia and ascites. It has been known from various studies worldwide that diabetes mellitus, obesity, increasing age, male sex, chronic kidney disease and obstructive sleep apnea; all are predictors of poor outcome in COVID-19 pneumonia. Földi, M et al. described higher ICU admission rate among patients with BMI values  $\geq 25$  kg/m<sup>2</sup> compared with patients with a BMI of  $\leq 25$  kg/m<sup>2</sup> or lower.<sup>3</sup> Obesity may predict increased mortality in COVID-19, besides need for higher oxygen supplementation or mechanical ventilation<sup>4</sup>. Williamson et al. stated the relationship between chronic kidney disease and COVID mortality as greater than other common risk factors, including chronic heart and lung disease.<sup>5</sup> The CORONADO study showed 10% hospitalized diabetic patient died within 7 days of admission where two thirds were men and treated obstructive sleep apnea patients had three time the risk.<sup>6</sup> Our patient was treated in ICU, keeping

in mind all of his co morbidities; which are already studied and validated as high risk for mortality among COVID-19 patients. Successful outcome of the patient is the result of multidisciplinary approach towards his co-morbidities and complications.

**Authors' contribution:** MNS followed up the patient, did literature search and drafted the manuscript. KNU reviewed the paper. Both authors read and approved final manuscript.

**Conflicts of interest:** Nothing to declare.

**Consent:** Informed written consent was obtained from the patient for publication of case report and accompanying images.

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