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Delaying escalation of care for a COVID-19 patient

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Background

Since being reported on December 31st 2019, COVID-19 rapidly escalated to a pandemic. Specifically in Detroit, as of March 28th 2020, there were 1075 cases and 23 deaths. The great number of patients rapidly overwhelmed various health systems in the metro Detroit area. Rapid identification of the disease is vital as preliminary reports have shown that multiple ED and clinic visits are associated with worse outcomes, likely due to delayed treatment. Our report describes the course of a COVID-19 patient who required multiple visits prior to diagnosis, and rapidly deteriorated.

Case Report

A 63-year old African American man presented to his PCP with sore throat, cough, and body aches. Patient endorsed symptoms for 4 days, no sick contacts, and flu swab was negative. Patient was diagnosed with a viral syndrome and prescribed rest and symptomatic care. The following day he went to the ED with worsening symptoms and hypotension and was sent home. The next day, patient went for a CXR (Figures 1A and 1B) where he developed SOB.

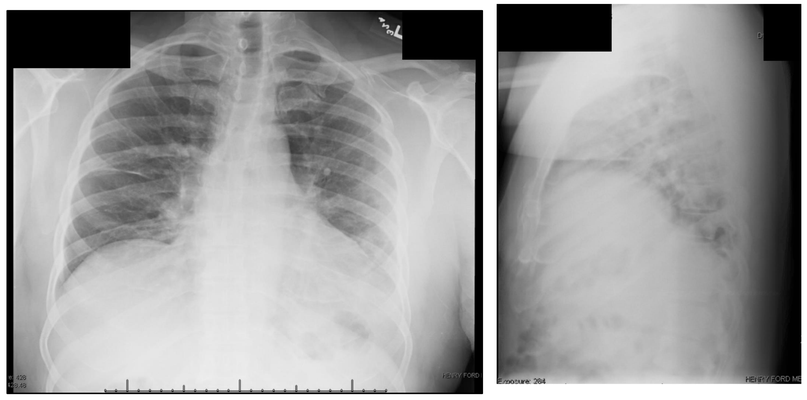

Figure 1: Chest x-ray prior to admission showing left greater than right opacities consistent with atypical pneumonia. A: AP view B: lateral view

Due to his distress and presence of bilateral pneumonia, he was sent to the ED to rule out COVID. At the ED, patient endorsed a fever, SOB, and chills. Patient's past medical history included asthma, hypertension, and diabetes. On exam, he was febrile but hemodynamically stable. Patient was ill-appearing, with decreased breath sounds on the left. Labs showed leukopenia, lymphopenia, and an AKI. COVID testing was sent. Patient was admitted, with airborne plus precautions, and antibiotics were started. On hospital day 3, patient became persistently febrile and hypoxic. ABG was done which showed a PaO2 of 55.9. Due to worsening respiratory status, patient was intubated and transferred to the MICU. CXR was repeated and showed worsening airspace opacities bilaterally, and small pleural effusions. (Figure 2A, B) COVID test came back positive and treatment began with Hydroxychloroquine, and use of Remdisivir pending. On hospitalization day 7, patient received Remdisivir and tocilizumab, with hopes that reduced systemic inflammation would lead to improvement of his ARDS.

Case Report

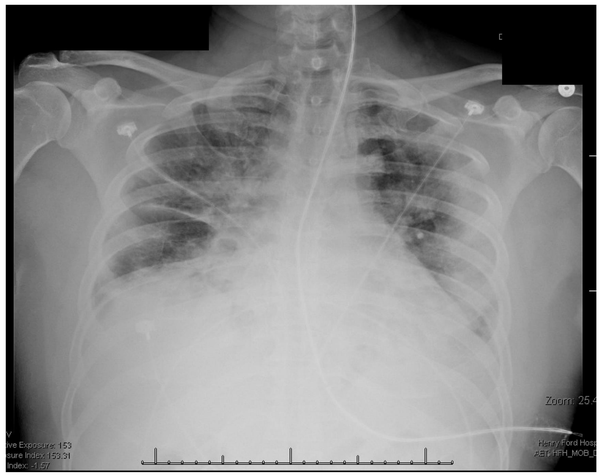

Figure 2: Hospital Day 3 CXR showing worsening airspace opacities within the lungs bilaterally, concerning for worsening multifocal pneumonia. As well as likely bilateral small pleural effusions.

	Illness Day									
	7	8	9	10	11	12	13	14	15	16
	Hospital Day									
	1	2	3	4	5	6	7	8	9	10
WBC count (K/µL)	7.4	4.9	6.8	6.2	5.6	5.9	4.9	6.8	13.7	17.8
Abs. Neutrophil Ct. (K/µL)	2.2	6.1	5.9	5.2	4.9	4.8	4.3	6	12.4	15.4
Abs. Lymphocyte Ct. (K/µL)	0.4	0.6	0.6	0.7	0.4	0.6	0.4	0.4	0.6	0.9
Platelet count (K/µL)	192	195	233	217	228	228	128	79	84	109
Hemoglobin (g/dL)	11.4	11.8	11.2	11.3	11.2	11.2	11.2	11.2	12.2	11.2
Sodium (mmol/L)	139	142	141	143	146	147	142	140	139	138
Potassium (mmol/L)	4.5	4.1	3.9	4.2	4.4	4.4	4.8	5.8	6.8	7
Chloride (mmol/L)	108	104	104	105	105	108	109	108	107	103
Calcium (mg/dL)	8	8	7.5	7.6	7.8	7.6	8.1	7.6	7.7	7.8
HCO3 (mmol/L)	26.3	24	29.1	30.3	33.7	32.3	34.2	30.8	31.1	29.1
Anion Gap	8	9	6	7	7	6	5	7	6	8
BUN (mg/dL)	14	19	18	19	19	30	45	47	54	69
Creatinine (mg/dL)	0.8	0.8	0.9	1	1	1	1.4	1.7	2.1	2.2
Procalcitonin (ng/mL)	0.43									
ALT (IU/L)	18	60	67	67	94	136	136	50	61	60
AST(IU/L)	41	108	116	133	203	154	45	36	59	55
LDH (IU/L)	596	691	776	745	742	629	532	521	618	617
PT (sec)	13.7									18.7
INR	1.09									1.63
PTT (sec)	38									38
CPK (IU/L)		164	161	163	133	107	49	360	218	92
Troponin (ng/L)	40	20	20	<18			<18	<18	<18	<18
Lactate (mmol/L)	0.9	1.1	1	0.9	1	1.3			1.2	2.3
D-Dimer (µg/mL)	1.2			3.5	3.1	11.6	>20	>20	>20	>20
CRP (mg/dL)	20.9		22.6	24.9	32.4	32.7	24.2	17.6	14.1	13.5
IL-6 (pg/mL)	81									
Fibrinogen (mg/dL)	526								81	107
Ferritin	1447		3523	3879	3161	2244	1295	1287	816	880

Table 1: Trend of labs and markers associated with increased morbidity and mortality for COVID patients

Case Report

Overnight, patient was hypotensive and nonresponsive to fluids. Levophed was begun, and vent settings were increased. On days 9 and 10, due to worsening hypoxia and inability to follow commands, patient was paralyzed to allow for more time to improve inflammation. Patient was placed on max vent settings, and his PaO2 sat was 57. CXR was repeated due to worsening vent requirements and showed no change. Subsequently, patient became tachycardic in the 120s, and hypotensive to the 80s. D-dimer was elevated, and patient desaturate when turned or repositioned. On day 11, patient was found to be hyperkalemic. Nephrology was consulted and determined the hyperkalemia was due to hemolysis secondary to DIC, but the patient was not a candidate for ultrafiltration or intermittent dialysis. Due to absent of clinical improvement, patient was transferred to comfort care, and expired.

Discussion

Our report elucidates the importance of rapid identification of a patient with COVID. Our patient had a standard presentation with cough, fever, body aches and sore throat, indicating that the possibility of COVID as the cause for the patient's presentation should have been considered. During a pandemic it is vital to practice with a high of index of suspicion. The importance of prompt identification of the illness becomes even more salient considering that current treatment approach is primarily symptomatic management, due to lack of clinically effective curative treatments. It may seem overly simplified, but the sooner a patient is able to receive these services, the more likely they are to recover. While our patient had multiple risk factors for deterioration due to COVID, such as HTN, and T2DM, our patient had two opportunities for escalation of care and identification of his underlying pathology that could have improved his prognosis. Further, our report is in line with preliminary findings that African Americans and patients who require multiple ED visits have more rapid deterioration and a more severe clinical course.

Learning objectives

- During a pandemic it is critical to practice with a high index of suspicion in order to escalate care as soon as it is necessary
- We further highlight the worse prognosis that patients face, when they require multiple office or ED visits prior to admission
- Rapid identification of high-risk patients is even more vital for illnesses, like COVID, that lack definitive treatment and rely on supportive care
- Future work should be done to develop tools to identify high-risk patients in the office or ED

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