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COVID19 infection revealed chronic myeloid leukemia in chronic phase: A case report

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ABSTRACT

COVID-19 outbreak has been a serious threat and it has been reported with different presentations and complications, here we report a 39 year old healthy male who presented with respiratory symptoms and investigation revealed that he is positive for SARS-CoV-2 and work up for Leukocytosis confirmed the diagnosis of CML.

Keywords: COVID 19, SARS-CoV-2, CML, first presentation

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Introduction:

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)¹, The disease was first described in December 2019, after a series of unexplained pneumonia cases were reported in Wuhan, Hubei Province, China in December 2019. Full-genome sequencing and analysis indicated that the coronavirus that causes COVID-19 is a betacoronavirus in the same subgenus as the severe acute respiratory syndrome (SARS) virus as well as several bat coronaviruses².

Since the beginning of this disease it was spreading rapidly and by the end of April 2020 it was affecting 210 countries around the world as per WHO with total number of cases Exceeded 3 million with more than 200 thousands deaths³, Most of the cases presented with symptoms like fever, cough, general fatigue an myalgia, however some case presented with symptoms related to the gastrointestinal system such as nausea, vomiting and diarrhea. Previously reported cases of CML described patients with CML in different phases infected with COVID 19 however patient in chronic phase CML may be asymptomatic and got discovered only incidentally during routine checkup or if they got infection like our patient.

The case:

This is a 39-year-old male with no previous medical issues presented with 2 days history of fever and dry cough which was associated with shortness of breath, review of systems was unremarkable other than what mentioned above. On physical exam the patient was in respiratory distress, febrile with temperature of 38.5 C, and he was requiring 2 liters of oxygen via nasal cannula to maintain oxygen saturation above 94%, Heart rate was 110 and blood pressure was 120/75, chest auscultation was positive for bilateral crackles, abdominal exam was unremarkable with no palpable organs.

Initial investigation showed high white blood cells with count of 68.8×10^3 (4×10^3),

Hemoglobin level was 10.9gm/dl, MCV 84.8 and platelets count of 629×10^3 with normal liver and kidney function, XR chest showed right upper and left lower lung zones of infiltrates, and the patient tested positive for COVID 19 by PCR from nasal swap; at the beginning we though that leukocytosis could be a lab error or could be related to concomitant bacterial infection so full septic work up was sent including blood and sputum cultures ,and the CBC was repeated which came back to show WBC of 68.2×10^3 and blood and sputum culture did not grew any organism so blood sample was sent for peripheral smear exam and it showed normochromic normocytic anemia. Severe leukocytosis, Slight anisopoikilocytosis, with occasional NRBCs, Leukocytes shift to the left with few circulating blasts, Slight increased platelets and the picture is consistent with CML, Ultrasound abdomen showed Hepato-splenomegaly with liver size of 22.2 cm and spleen of 17.7 cm ,BCR/ABL testing from peripheral blood sample was consistent with a rearrangement of BCR/ABL1 in 96.5 % of nuclei so the patient was diagnosed with chronic myeloid leukemia.

During hospitalization the patient started on COVID 19 treatment as per our hospital protocol so he was started on azithromycin, hydroxychloroquine, ceftriaxone, oseltamivir and lopinavir/ritonavir, in addition to that he was started on hydroxyurea due to high WBC count, despite that his oxygen requirement was increasing chest X-ray showed bilateral infiltrate as illustrated in (image1), on third day of admission patient was tachypneic and desaturating on 15 liters of oxygen via non rebreathing mask so he was intubated and admitted to the intensive care unit and he was started on methylprednisolone with piperacillin/tazobactam and post intubation X ray chest is shown in (Image2) which worsening of the bilateral infiltrate, with endotracheal tube(white arrow), central line (yellow arrow) and NG tube (black arrow). And on the following 3 days he received 2 doses of tocilizumab, few

days later the patient condition started to improve, and he was extubated on day 9, after that his condition continued to improve during the subsequent days and he was started on

imatinib as upfront and on the day of discharge CBC was as follow: WBC: 6.3×10^3 , HB level 11.8 gm/dl and platelets count was 409×10^3 .

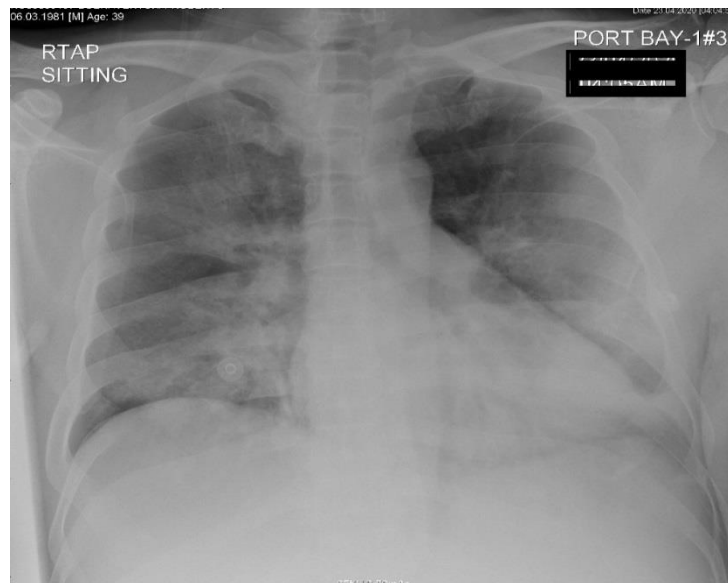


Figure 1: XR chest which shows bilateral infiltrate

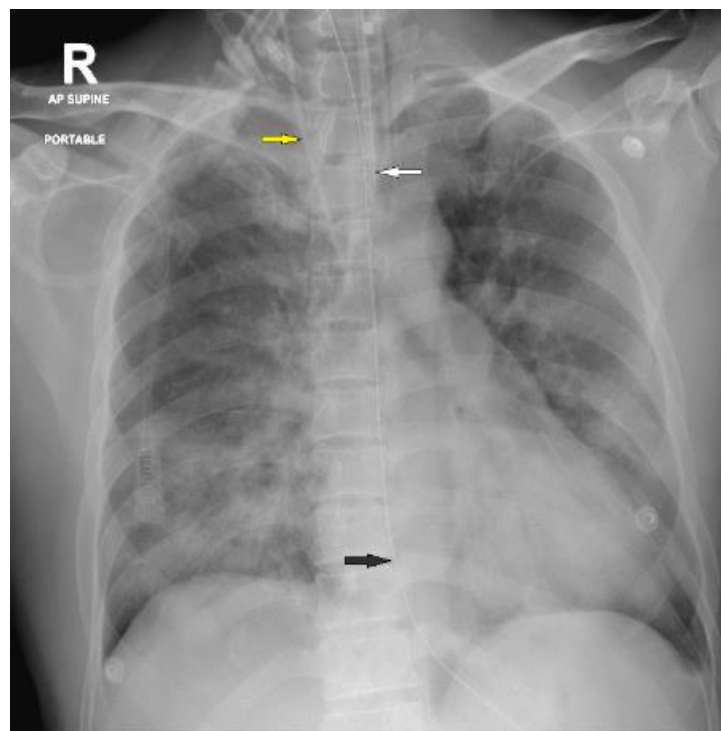


Figure 2: XR chest post intubation shows worsening of lung infiltrate with central line (yellow arrow), endotracheal tube (white arrow) and NG tube (Black arrow)

Discussion:

Chronic myeloid leukemia (CML) is a myeloproliferative neoplasm characterized by the dysregulated production of mature and

maturing granulocytes with normal differentiation, and it is associated with the fusion of two genes: *BCR* (on chromosome 22) and *ABL1* (on chromosome 9) resulting in the

BCR-ABL1 fusion gene. That gives rise to an abnormal chromosome 22 called the Philadelphia (Ph) chromosome. CML has three phases which included; chronic phase, accelerated phase and blast phase ⁴.

It is well known in the literature some viral infections increases the risk of some hematological malignancy Epstein-Barr virus the risk of Burkitt lymphoma, and non-Hodgkin's lymphoma and human T-lymphotrophic virus (HTLV-1) which increase the risk of adult T-cell leukemia/lymphoma⁵ but so far the exact mechanism of cancer development after viral infection is not well understood. Up to our knowledge there is no viral infection was proven to increases risk of CML.

Since the discovery of COVID 19 it has been reported in the literature to be associated with other diseases at time of presentation like association with acute ST elevation myocardial infarction⁶, and the association with neurological diseases like meningitis and encephalitis ⁷, also it was reported with Guillain-Barré Syndrome⁸ or may even happen in patients with Myeloproliferative Neoplasms⁹ in particular CML¹⁰ or other hematological malignancies like CLL¹¹. In Our case the presentation of COVID 19 was associated with CML at the time of presentation; however we believe that this association is only a coincidence and any abnormal results during this pandemic should be taken seriously as it can harbor more grim disease. This patient was started on imatinib 400 mg daily as upfront therapy for CML treatment does not need to be changed depending on COVID 19 status and he was discharged with regular follow up as per ASH recommendations 2020 ⁹.

Conclusion:

During this pandemic physician will be directed to the diagnosis and management of COVID 19 infection and this may divert them from other more serious diagnoses in particular cancers, so we report this case for health care worker to pay attention for any abnormality which is not explained by COVID 19 infection.

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Statement of Ethics:

This case report was approved by Hamad medical corporation medical research center and institutional review board.

As per hamad medical corporation medical research center no need for informed consent for case report unless it contains identifiers.

Consent was not needed as our case does not contain identifiers

Conflict of interest statement:

Authors have nothing to disclose

Authors Contributions:

Khalidun Obeidat: writing and editing the manuscript, clinical management

Mohamed A Yassin: Writing and editing, clinical management

Mohamed aboukamar: clinical management

References:

1. "Coronavirus disease 2019 (COVID-19)—Symptoms and causes". *Mayo Clinic*. Retrieved 14 April 2020.
2. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, Si HR, Zhu Y, Li B, Huang CL, Chen HD, Chen J, Luo Y, Guo H, Jiang RD, Liu MQ, Chen Y, Shen XR, Wang X, Zheng XS, Zhao K, Chen QJ, Deng F, Liu LL, Yan B, Zhan FX, Wang YY, Xiao GF, Shi ZL
3. <https://coronavirus.jhu.edu/map.html>
4. Turkina, A., Wang, J., Mathews, V., Saydam, G., Jung, C.W., Al Hashmi, H.H., Yassin, M., Le Clanche, S., Miljkovic, D., Slader, C. and Hughes, T.P. (2020), TARGET: a survey of real-world management of chronic myeloid leukaemia across 33 countries. *Br J Haematol*. doi:10.1111/bjh.16599
5. <https://www.cancer.org/cancer/cancer-causes/infectious-agents/infections-that-can-lead-to-cancer/viruses.html>
6. Corona Virus Disease 2019 (COVID-19) Presenting as Acute ST Elevation Myocardial Infarction. Siddamreddy S¹, Thotakura R², Dandu V³, Kanuru S^{4,5}, Meegada S⁶.

7. A first case of meningitis/encephalitis associated with SARS-Coronavirus-2. Moriguchi T¹, Harii N², Goto J³, Harada D³, Sugawara H³, Takamino J³, Ueno M³, Sakata H³, Kondo K³, Myose N³, Nakao A⁴, Takeda M⁵, Haro H⁶, Inoue O⁷, Suzuki-Inoue K⁸, Kubokawa K⁹, Ogihara S¹⁰, Sasaki T⁸, Kinouchi H¹¹, Kojin H¹², Ito M¹², Onishi H¹³, Shimizu T¹³, Sasaki Y¹³, Enomoto N¹⁴, Ishihara H¹⁵, Furuya S¹², Yamamoto T¹², Shimada S¹⁶.
8. Guillain-Barré Syndrome associated with SARS-CoV-2 infection. Virani A¹, Rabold E¹, Hanson T², Haag A², Elrufay R³, Cheema T¹, Balaan M¹, Bhanot N³.
9. Yassin MA, Taher A, Mathews V, Hou HA, Shamsi T, Tuğlular TF, Xiao Z, Kim SJ, Depei W, Li J, Rippin G. MERGE: a multinational, multicenter observational registry for myeloproliferative neoplasms in Asia, including Middle East, Turkey, and Algeria. *Cancer Medicine*. 2020 Apr 30.
10. Abdalhadi AM, Alshurafa A, Alkhatib M, Abou Kamar M, Yassin MA. Confirmed Coronavirus Disease-19 (COVID-19) in a Male with Chronic Myeloid Leukemia Complicated by Febrile Neutropenia and Acute Respiratory Distress Syndrome. *Case Reports in Oncology*. 2020;13(2):569-77
11. Scarfò L, Chatzikonstantinou T, Rigolin GM, Quaresmini G, Motta M, Vitale C, Garcia-Marco JA, Hernández-Rivas JÁ, Mirás F, Baile M, Marquet J. COVID-19 severity and mortality in patients with chronic lymphocytic leukemia: a joint study by ERIC, the European Research Initiative on CLL, and CLL Campus. *Leukemia*. 2020 Jul 9:1-0.
12. Al-Dewik NI, Morsi HM, Samara MM, Ghasoub RS, Gnanam CC, Bhaskaran SK, Nashwan AJ, Al-Jurf RM, Ismail MA, AlSharshani MM, AlSayab AA. Is adherence to imatinib mesylate treatment among patients with chronic myeloid leukemia associated with better clinical outcomes in Qatar?. *Clinical Medicine Insights: Oncology*. 2016 Jan;10:CMO-S32822.
13. Al-Dewik NI, Jewell AP, Yassin MA, El-Ayoubi HR, Morsi HM. Molecular monitoring of patients with chronic myeloid leukemia (CML) in the state of Qatar: optimization of techniques and response to imatinib. *QScience Connect*. 2014 Mar 1;2014(1):24.

