European Review for Medical and Pharmacological Sciences 2020; 24: 10850-10852

Isolated immune thrombocytopenic purpura in a young adult Covid-19 patient

E. MOLINARO[1], E. NOVARA[1], R. BONOMETTI[2], M.C. SACCHI[3], P. STOBBIONE[4], E.C. LAURITANO[2], R. BOVERIO[2]

[1]Department of Emergency Medicine, IRCCS San Matteo Hospital Foundation University of Pavia, Pavia, Italy
[2]Department of Emergency Medicine, Santi Antonio e Biagio e Cesare Arrigo Hospital, Alessandria, Italy
[3]Department of Laboratory Analysis, Autoimmune Sector, Santi Antonio e Biagio e Cesare Arrigo Hospital, Alessandria, Italy
[4]Department of Rheumatology, Santi Antonio e Biagio e Cesare Arrigo Hospital, Alessandria, Italy

Abstract. – OBJECTIVE: Patients with Covid-19 can have different symptoms, ranging from asymptomatic patients to various grades of respiratory failure, caused by typical interstitial pneumonia, cardiac involvement or neurological symptoms.

PATIENTS AND METHODS: In April 2020, we focused our attention on a young woman with diffused purpura on her lower extremities, with no respiratory, cardiac or neurological symptoms. A complete blood analysis showed us a severe thrombocytopenia. We excluded other possible causes of thrombocytopenic purpura such as hematological (lymphocyte subsets), hepatological disease or splenomegaly. On autoimmune screening, we found Isolated immune thrombocytopenic purpura in a young adult Covid-19 patient positivity of anti-nuclear antibody (ANA) with a centrosome pattern and extractable nuclear antigens (ENA) and connective tissue disease screen resulted positive but none of the included specific antigens results positive, probably due to an aspecific antibody reaction. The wide variability of COVID disease presentation may be due to a personal different immune response to the virus.

CONCLUSIONS: The immune response against the virus is crucial in the evolution and understanding of COVID-19 disease but it has still to be fully understood.

Key Words:
Immune thrombocytopenia, Purpura, Covid-19.

Case report

A 19-year-old young woman with an unremarkable past medical history, except for known SARS-CoV-2 exposure, presented to the Emergency Department with diffuse petechial rash, fatigue, and ageusia. She reported fever for a few days two weeks earlier. At the presentation, she was afebrile, with normal oxygen saturation in ambient air. Physical examination revealed normal bilateral breath sounds in addition to a diffuse not itchy purpuric lesions most represented on lower extremities (Figure 1). Laboratory tests showed a severe thrombocytopenia (2x1000/mmc, normal value 156-405x1000/mmc), leukocytosis with lymphocytosis (white blood cell count: 12.22 x1000/mcl, normal value 4.00-10.00 x1000/mcl, with 31.9% neutrophils and 60.5% lymphocytes), normal C-reactive protein level, elevated alanine transaminase level (219 U/l, normal value 0-49 U/l), aspartate transaminase level (140 U/l, normal value 0-40 U/l) as well as serum lactate dehydrogenase level (910 U/l, normal value 230-500 U/l). The nasal swab for Covid-19 testing resulted positive. Arterial blood gas analysis was normal such as chest X-Ray, thoracic and abdominal ultrasound. At a first morphological evaluation, the presence of some active lymphoid elements and lymphomonocytes was shown in the peripheral blood smear. At the immunophenotypic evaluation, no immature elements were found, but increased prevalence of CD8, a more typical finding in viral infections. Autoimmunity panel was analyzed, including the anti-nuclear antibodies (ANA), the antineutrophil cytoplasmic antibodies (ANCA), myeloperoxidase (MPO) and proteinase 3 (PR3), anti-Saccharomyces cerevisiae antibody (ASCA), Connective Tissue Disease

Corresponding Author: Elena Molinaro, MD; e-mail: elena.molinaro01@universitadipavia.it

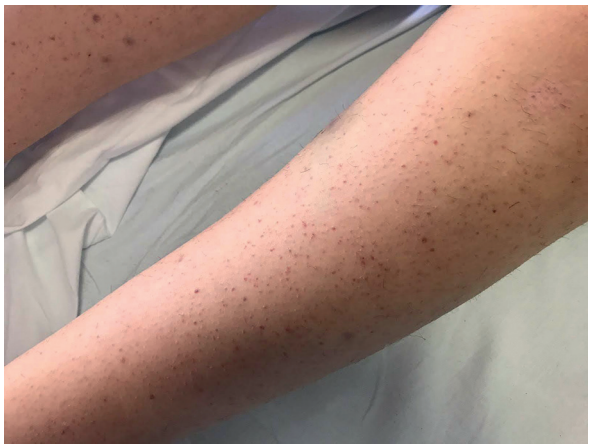

Figure 1. Diffuse not itchy purpuric lesions.

(CTD) screen, antiphospholipid antibodies. The ANA level was positive, with a centrosome pattern (AC-24 by International Consensus on ANA Patterns)[1] and a titer of 1:160. The CTD screen was also positive (value: 1,5 ratio), but none of the including antigens (U1RNP, SS-a/Ro, SS-B/La, centromere B, Scl-70, Jo-1, fibrillarin, RNA Pol III, Rib-P, PM-Scl, PCNA, Mi-2 proteins, Sm proteins and native purified DNA) results positive, probably due to a nonspecific antibody reaction. The other autoimmunity tests were negative. During hospitalization, intravenous immunoglobulins (400 mg per kilogram of body weight) and intravenous steroid (methylprednisolone 1 mg per kilogram of body weight) were administered for 5 days. Hydroxychloroquine and antiretroviral agents were also administered. On day 3, the platelet count increased to 7x1000/mmc; on day 4, to 40x1000/mmc; on day 5, to 98x1000/mmc. Purpura gradually reduced. No significant symptoms were reported, and the patient was discharged with the indication for further cell blood count and hematological and rheumatological follow-up.

Discussion

Coronavirus disease 2019 (COVID-19) is a respiratory tract infection caused by a newly emergent coronavirus, SARS-CoV-2, that was first recognized in Wuhan, China, in December 2019[2]. The severity of COVID-19 is variable, ranging from an asymptomatic form to acute respiratory distress syndrome and multi-organ failure. The most common symptoms are fever, dry cough, dyspnea, fatigue, loss of smell, and taste. Less common manifestations include body aches, abdominal discomfort, diarrhea, myocarditis, neurological symptoms, and cutaneous lesions[3]. Also, hematological changes are common in COVID-19 patients, including reduced platelet count. The mechanisms of thrombocytopenia are unclear and include direct infection of bone marrow cells by the virus, platelet destruction by the immune system and platelet consumption as result of microthrombi formation[4]. In most cases, the platelet count doesn't decrease to a level at which severe bleeding occurs; however, when thrombocytopenia is present, it is associated with an enhanced risk of severe COVID-19 and increased mortality[5]. We presented an uncommon case of severe but isolated thrombocytopenia in a young COVID-19 patient. The immune pattern of our patient (AC-24, that is frequently found in patients with Raynaud's phenomenon, localized scleroderma, systemic sclerosis, systemic lupus erythematosus and rheumatoid arthritis) and the optimal response to immunoglobulins and steroid therapy suggest that the thrombocytopenia was an immune-mediated phenomenon.

Conclusions

Platelet count is an important parameter included in numerous classification systems that evaluate disease severity and also in COVID-19 infection the presence of thrombocytopenia seems relate with disease severity and indicates the presence of a consumable coagulopathy[6]. In our young positive COVID-19 patient, the finding of severe paucisymptomatic thrombocytopenia would seem to be explained by the likely development of autoantibodies, rather than by a severe septic state or the administration of anticoagulants. As proof of this, the fact that it was treated as an autoimmune thrombocytopenia (immunoglobulin and steroid) with complete normalization of the values.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Statement of Human and animal Rights

All procedures performed in the study were in accordance with the ethical standards of the institutional and/or National Research Committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

The patient was informed of the scientific and clinical interest of her disease and was informed of this anonymous publication. She gave an informed verbal consent to the anonymous publication.

Funding

No funding.

References

1) Damoiseaux J, Andrade LEC, Carballo OG, Conrad K, Francescantonio PLC, Fritzler MJ, Garcia de la Torre I, Herold M, Klotz W, Cruvinel WM, Mimori T, von Muhlen C, Satoh M, Chan EK. Clinical relevance of Hep-2 indirect immunofluorescent patterns: the international Consensus on ANA patterns (ICAP) perspective. Ann Rheum Dis 2019; 78: 879-889.
2) Team NCPERE. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. Zhonghua Liu Xing Bing Xue Za Zhi 2020; 41: 145-151.
3) Recalcati S. Cutaneous manifestations in COVID-19: a first perspective. J Eur Acad Dermatol Venereol 2020 doi: 10.1111/jdv.16387. [Epub ahead of print].
4) Xu P, Zhou Q, Xu J. Mechanism of thrombocytopenia in COVID-19 patients. Ann Hematol 2020 doi: 10.1007/s00277-020-04019-0. [Epub ahead of print].
5) Lippi G, Plebani M, Henry BM. Thrombocytopenia is associated with severe coronavirus disease 2019 (COVID-19) infections: a meta-analysis. Clin Chim Acta 2020; 506: 145-148.
6) Frater JL, Zini G, d'Onofrio G, Rogers HJ. COVID-19 and the clinical hematology laboratory. Int J Lab Hematol 2020 Apr 20.