CASE REPORT

Severe Thrombocytopenia in COVID-19: A Conundrum in Dengue-endemic Areas

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Abstract

Thrombocytopenia in COVID-19 can be attributed to multiple factors. Most often it is disease related. It is usually mild and if severe often associated with severe COVID-19 disease. It can also be due to drugs (Remdesivir, Tocilizumab) or coinfection with other viruses. Here we report two cases of severe thrombocytopenia in COVID-19 due to dengue coinfection. Most often the thrombocytopenia in dengue is self-resolving, and a careful "wait and watch" should suffice unlike COVID-19, where steroids can help if the cytopenia is due to cytokine storm or immune-mediated effects.

Keywords: COVID-19, Dengue, Thrombocytopenia.

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Introduction

Thrombocytopenia in COVID-19 can be attributed to multiple factors. Most often it is disease related. It can be due to the reduced production of platelets from bone marrow because of cytokine storm or direct viral infiltration of the marrow and due to the increased peripheral destruction from immune-mediated effects or excessive peripheral consumption as a result of microthrombi formation.[1] Thrombocytopenia in COVID-19 is usually mild and if severe it is often associated with severe COVID-19 disease.[2] The mean platelet count varied from $164 \times 10^3/mm^3$ to $196 \times 10^3/mm^3$ among various cohorts of COVID-19 cases. Severe life-threatening thrombocytopenia was not seen in these cohorts. There are many isolated case reports of severe thrombocytopenia in COVID-19 and were mostly attributed to immune-mediated peripheral destruction.[3–5] It can also be due to drugs (Remdesivir, Tocilizumab) or coinfection with other viruses. Dengue is a mosquito-borne viral illness that is endemic in many countries and its incidence is worrisome in our area during this pandemic.[6] Here we report two cases of severe thrombocytopenia in COVID-19 due to dengue coinfection. Most often the thrombocytopenia in dengue is self-resolving, and a careful "wait and watch" should suffice unlike COVID-19, where steroids can help if the cytopenia is due to cytokine storm or immune-mediated effects.

Case Report

Two patients presented with dengue coinfection. First was a 34-year male who presented with fever and headache for one day. His oropharyngeal swab for SARS-CoV-2 PCR was positive. His investigations showed a total leucocyte count of $2.9 \times 10^9/L$ with 27% lymphocytes and a platelet count of $53 \times 10^9/L$. The second case was a 54-year male with fever and severe body ache for 3 days. His oropharyngeal swab for SARS-CoV-2 PCR was positive. His total leucocyte count was $4.8 \times 10^9/L$ with 40% lymphocytes and platelet count was $20 \times 10^9/L$. There were no bleeding manifestations, and both were hemodynamically stable. A rapid ELISA for dengue NS1 antigen was positive in both cases. First case was managed symptomatically with paracetamol and oral fluids. His platelet count normalized in 5 days. The second case was given dexamethasone 6 mg for 5 days, and his platelet count normalized in 6 days. Both had no other complications of dengue or COVID-19. The repeat nasopharyngeal swab for rapid antigen test SARS-CoV-2 was negative on the 10th day in both cases and were discharged.

Thrombocytopenia often alerts the physician in COVID-19. Dengue coinfection can be a cause for it. This can cause severe thrombocytopenia and can be life-threatening. Early identification of coinfection can help the physician in anticipating other dengue-related complications like dengue shock syndrome and dengue hemorrhagic fever, which otherwise would have been attributed to severe COVID-19 and the treatment would have been initiated as for severe COVID-19. Few things can point to non-COVID reasons for severe thrombocytopenia in COVID-19 cases. Fever, headache, body ache, and severe fatigue are common to both the viral illnesses. Unlike dengue, skin manifestations are rare in COVID-19.[7] Dengue fever is characterized by maculopapular and diffuse erythematous rash in more than 50% of patients.[8] Presence of rash with thrombocytopenia in COVID-19 should alert a

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physician in this regard. Also, disease-related thrombocytopenia in COVID-19 is often associated with severe disease. If the patient is asymptomatic or mildly symptomatic for COVID-19, other causes like coinfection with dengue as in the index cases should be thought of for severe thrombocytopenia. In both the index, patients were only mildly symptomatic for COVID-19. Despite the dengue coinfection, COVID-19 did not worsen and there was no persistence of antigen positivity. This may be due to the enhanced nonspecific antiviral response elicited by the coinfection. This possible synergistic effect needs to be studied further. But this is not always the case. Few deaths have been reported due to the coinfection.[9] Making the diagnosis of coinfection is also difficult as false-positive serological tests for dengue have been seen in COVID-19 patients.[10] So, we will have to go with antigen-based tests for a proper diagnosis.

In conclusion, dengue coinfection can cause severe thrombocytopenia in COVID-19 and identifying it early can help in the better management of patients.

Highlights

- Dengue coinfection can cause severe thrombocytopenia in COVID-19.
- Dengue–COVID-19 coinfection and severe thrombocytopenia had good outcome at discharge.

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