Parvovirus B19: An opportunistic healthcare burden

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Parvovirus B19 is notoriously a cause of normocytic anaemia in patients in an immunocompromised state, more so than in patients without prior disease. It is increasingly prevalent in children and adults in an HIV-induced immunocompromised state, and its presentation may be varied. Red-cell aplasia and normocytic anaemia are common presenting derangements found. Here, we note the typical presentation of red-cell aplasia re-entering healthcare, with a dire effect on the quality of life of this patient.

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The patient presented with symptomatic anaemia more than once, requiring several blood transfusions alongside management for cryptococcal meningitis (CCM) and advanced HIV. This patient was concerned about her inability to work due to recurrent admissions and the multitude of infections affecting her activities of daily living (ADLs). The patient's family were supportive in aiding her recovery and rehabilitation into normal ADLs once the management of her opportunistic infections was employed.

The patient received definitive tertiary-level care management because of the secondary opportunistic parvovirus B19. Since receiving tertiary-level care for parvovirus B19, HIV and CCM, the patient has been stable and has not been re-admitted for symptomatic management. She has attempted to return to her normal daily activities.

Parvovirus B19 causes an array of symptoms dependent on the infected host's immune system. We see a direct correlation between the severity of symptoms caused by this virus and the state of immune compromise of this host. Early detection, adequate symptomatic management and appropriate referral for tertiary care are life-saving in these patients.

The common presentations of this virus in immunocompetent populations can be a mild rash, joint swelling and a sore throat, whereas infections in immunocompromised patients give rise to absolute complications of this virus with moderate to severe anaemia.

This is a portrayal of parvovirus exacerbating the symptoms elicited by the current stage of HIV in the patient and inflicting a burden of care upon the patient and healthcare system.

Ethical considerations

The reference patient in this case report gave consent for her case to be published, followed with anonymity.

Patient presentation

A 34-year-old woman was diagnosed with HIV in 2018 and started on antiretroviral (ARV) therapy, with a CD4+ count of 4 cells/uL, but defaulted after nearly a year. The patient was then referred by her local clinic to our district hospital in 2021, 4 years later, for re-initiation of ARV treatment (ART).

The patient was evaluated for any opportunistic infections before starting ART as per standard guidelines, and found to be symptomatic of headaches. Therefore a full workup was done to exclude all common causes of headache, as well as a reflex cryptococcal antigen test. It was found that the patient was infected with CCM and had profound symptomatic anaemia, which was noted to be normocytic anaemia.

The patient then received a blood transfusion for a noted haemoglobin level of 2.7 g/dL, and was fully treated for CCM as an inpatient, and restarted on ART 8 weeks later.

Despite adequate compliance with ART, she was admitted three times post the above admission for repeated blood transfusions, affecting her quality of life and treatment adherence. The patient was noted to have successive high HIV viral loads, which prompted a concern for ARV review, but due to the repeated anaemia presentations, the patient was investigated for parvovirus using a polymerase chain reaction laboratory test.

On clinical examination, the patient had symptoms and signs of World Health Organization HIV stage 4 AIDS-defining illness, represented by recent cerebral cryptococcosis and oral candida. This patient also had marked pallor, respiratory distress, tachycardia and headaches. Mild myalgia and joint pain were noted.

Laboratory findings on last admission

Full blood count revealed white-cell count 4.57 × 10^9/L, haemoglobin (Hb) 4.7 g/dl, platelets 621 and a mean corpuscular volume 87.2 fl. A pure red-cell aplasia was noted, as is typical for a parvovirus B19 presentation. Red-cell aplasia was diagnosed on blood results and presentations, and upon discussion with Tygerberg Tertiary Academic Hospital haematology unit.

Further investigation for other common confounding causes of anaemia yielded negative results.

Following the repetitive blood transfusions and multiple re-admissions, the patient tested positive for parvovirus, with a parvovirus viral load of 7002703315 copies/mL (viral log 9.8).

Management and outcome

The patient was given her third red blood cell transfusion in a space of 4 months, and her post-transfusion Hb was 11 g/dL, alongside compliance with the continuation of ART fixed-dose regimen (dolutegravir, tenofovir, lamivudine).

She was counselled on high viral load and symptoms, signs of symptomatic anaemia due to parvovirus and told when to return to hospital. Enhanced adherence counselling for ARVs was done and the patient remained compliant on serial follow-ups. Post the above admission, on her fourth successive follow-up, it was noted that her Hb had once again dropped. She was then discussed with the haematology unit at Tygerberg Hospital for transfer, who accepted

her for immunoglobin treatment that lower-level hospital institutions do not have access to.

The patient then received 6 days of intravenous immunoglobulin Polygam.

Discussion

In physiology, we know that parvovirus can manifest clinically irrespective of the immune status of the patient. However, manifestations tend to increase in severity proportional to the immune decline of the patient.[1,2]

This case study portrays the severity and recurrence of parvovirus in a patient with advanced HIV stage. It portrays the virus thriving in a host who is immunocompromised, with an opportunistic infection already causing a clinical decline towards AIDS.

Common symptoms and laboratory signs in an immunocompromised patient include:[4-6]

- myalgia
- abdominal pain
- lethargy
- red-cell aplasia
- normocytic anaemia.

Suggested management

In all cases, symptomatic management should be employed first. This management spectrum includes 'watching', following up patients, prescribing haematinics or admission for red blood cell transfusions.[6] The management of each patient should be individualised on the same principles as the aforementioned spectrum, treating not only the parvovirus but any concomitant opportunistic infection and the underlying condition causing the consistent immunocompromised state.[7,8]

In severe cases causing recurrent admissions or impacting the quality of life of the patient, patients need to be referred promptly to a tertiary-level institution.[9,10]

Conclusion

Parvovirus manifests in immunocompetent and immunocompromised patients alike, with severity increasing in immunocompromised states. Patients who are immunocompromised will need to be treated for any opportunistic infections that can cause imminent mortality first, thereafter addressing the parvovirus according to the symptoms it presents in the patient. These immunocompromised patients need to be followed up frequently for management of their immunocompromised state and symptom review, allowing the clinician to urgently refer them for tertiary-level management for parvovirus at the correct interval.

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