Novel Pathogen unmasks old Infection: COVID-19 Infection triggers Erythema Nodosum Leprosum Reaction

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Background:

Leprosy is a chronic mycobacterial infection which affects the skin and peripheral nerves. Varied clinical presentations can be provoked by acute immunoreactive states. SARS-CoV-2 infection has emerged as a pro-inflammatory catalyst(1) and in this case triggered an exaggerated host response leading to a new diagnosis of erythema nodosum leprosum (ENL) complicating lepromatous leprosy (LL), which has not previously been described.

Case Presentation:

A 30-year-old gentleman with no previous medical history reported a 5-day history of dry cough, fevers and headache. Nasopharyngeal swab confirmed COVID-19 infection.

He also reported progressive swelling of his hands and face and on further questioning had experienced intermittent burning pain in his hands and feet in the months preceding. Examination revealed a facial rash with malar hypopigmentation and distal loss of pinprick sensation on neurological exam.

A skin biopsy was undertaken to further evaluate the facial rash and demonstrated non-necrotising epithelioid granulomas within the dermis with a concurrent inflammatory process appearing to involve cutaneous nerves. Ziehl-Neelson stain showed numerous bacilli within granulomas in keeping with a mycobacterial infection. The clinical features and histological findings pointed towards a diagnosis of erythema nodosum leprosum (2) complicating borderline or lepromatous multibacillary subtype of leprosy possibly precipitated by COVID-19 infection. As per the WHO treatment recommendations, he was commenced on a 12-month regimen of clofazimine 300mg monthly and 50mg daily, dapsone 100mg daily and rifampicin 600mg monthly. He was also started on oral prednisolone 60mg for erythema nodosum leprosum.

Discussion

We postulate that acute COVID-19 infection unmasked a chronic lepromatous infection with an inflammatory complication, namely erythema nodosum leprosum. His acute liver injury on initiating anti-mycobacterial and steroid treatment posed a major challenge. It was unclear if the erythema nodosum leprosum inflammatory reaction triggered an acute hepatitis or if the anti-mycobacterial therapy could be contributing. We were able to restart therapy after steroid treatment and improvement in liver enzymes. Despite treatment, this gentleman had residual impairment of hand function which demonstrates the debilitating effects of leprosy infection.

The most striking part of this case is the way in which the novel COVID-19 pathogen had a catalytic effect on the manifestations of leprosy, one of the oldest known infectious diseases. Both can cause an immunoreactive inflammatory reaction and the underlying mechanism is unclear. This has not been reported in the literature previously.

References:

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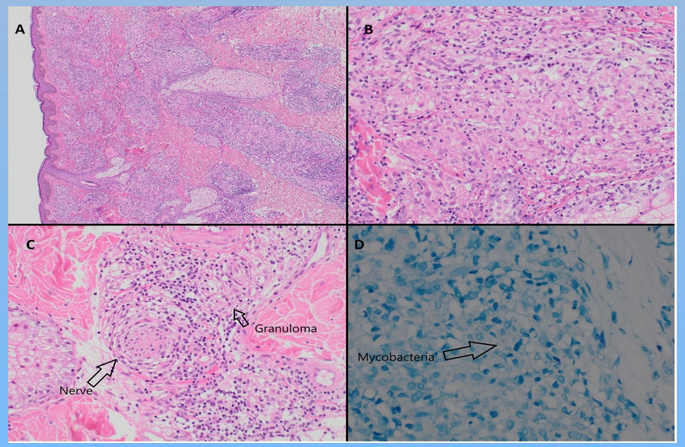

Figure 1. *Skin biopsies of a 30-year-old gentleman showing Mycobacterium Leprae infection*
A: Haematoxylin and eosin-stained section using low-power magnification
B: Haematoxylin and eosin-stained section of a specimen from the face using high-power magnification
C: Haematoxylin and eosin-stained section of a specimen from the face using high-power magnification showing granulomatous dermal inflammation (arrow) with evidence of nerve involvement (arrow) suggestive of leprosy
D: Ziehl-Neelsen (ZN) stain demonstrates acid-fast bacilli in keeping with mycobacterial infection