Devic’s neuromyelitis optica associated with active pulmonary tuberculosis, Tunisia

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Abstract

Devic’s Optic neuromyelitis (OND) is a very rare disease defined as a central nervous system (CNS) inflammation resulting in optic neuritis and/or myelitis. The discovery of a highly specific serum autoantibody biomarker for the diagnosis has triggered great interest in conducting further research into this disease. The association of OND with Tuberculosis (TB) is even rarer and could be an entirely random conjunction. To our knowledge, we reported the first case of Neuromyelitis Optica associated with pulmonary TB in Tunisia.

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Case report

We report the case of a 28-year-old man with no medical history. He presented to the emergency room complaining of ocular pain, blurred vision, gait disorders and dysuria. He also sought care for respiratory symptoms including cough with a small amount of haemoptysis, fever and a decrease in general condition over the preceding few months. At admission, he developed complete urinary retention and a spastic paraplegia.

To the Editor,

Considered for a long time as a form of multiple sclerosis [1], Devic’s optical neuromyelitis, also called neuromyelitis optica (NMO), is a rare anatomic and clinical entity that involves the optic pathways and spinal cords, without causing severe brain injuries [2]. It is an inflammatory demyelinating disease of the central nervous system [2]. The association of NMO with tuberculosis (TB) is scarce and could be an entirely random conjunction. To our knowledge, only a few case reports associating these two diseases exist in medical literature [3–6]. We provide the first detailed Tunisian case report of NMO associated with pulmonary TB.

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not supported by microbiological data. So, the diagnosis of Devic syndrome revealing associated pulmonary TB was confirmed.

The patient was treated with parenteral corticosteroid therapy along with immunoglobulins. Anti-tubercular therapy was also given for 6 months. The outcome was only partially favourable with persistent paraplegia.

The ophthalmological examination of the left eye at follow up (4 months later) showed optic neuritis. The patient had no light perception and a quiet anterior chamber. His pupillary light reflex was absent with a positive Marcus Gunn sign. The crystalline lens was transparent and the conjunctiva was pale with clear edges. He had a normal spontaneous venous pulsation.

Discussion

Devic’s neuromyelitis optica is characterized by the onset of concomitant visual impairment and myelitis due to optic nerve and spinal cord demyelination [1,7]. The pathophysiological mechanism is still uncertain but is probably of immunological origin. During NMO, the immune system produces autoantibodies that target a protein called aquaporin-4, which is expressed by astrocytes. Thereafter a cascade of reactions leading to damage of the entire nervous tissue is triggered.

These reactions cause an inflammatory response that destroys the myelin sheath covering the neurons, and also the neuron itself, which explains the neurological symptoms of the disease.

Although the association of NMO with active pulmonary TB has been reported and might not be a simple coincidence, a causal relation between the two conditions has not been demonstrated [3]. Moreover, pulmonary and central nervous system TB must be ruled out before making the diagnosis [8].

Anatomopathological study of spinal cord injuries has demonstrated that the humoral immunity dysregulation is triggered by an infectious agent [7]. In fact, *M. tuberculosis* surface antigens might initiate the production of reactive antibodies against aquaporin-4 proteins leading to the acute demyelination [9].

Another argument supporting this causative association between NMO and active TB is the onset of demyelination clusters being far from infectious clusters. Moreover, in experimental studies, demyelination occurred after an intracisternal injection of antigenic *Mycobacterium tuberculosis* or tuberculin extracts [10].

Anti-bacillary treatment toxicity leading to NMO is another hypothesis that has been discussed. However, it remains inconclusive, considering the possibility of neuroophthalmological damage before the initiation of TB treatment and the beneficial impact of anti-tubercular therapy in patients suffering from steroid-refractory NMO [4].
As the immune response against active TB infection is commonly cell-mediated rather than a humoral response, the combination of the two entities could be a pure coincidence and still needs to be proven [4].

Neuromyelitis optica is generally associated with pulmonary TB. Lungs are most often infected by the bacilli when compared with other sites. Nevertheless, further TB localizations have been reported such as abdominal TB [5] and renal TB [6].

The treatment is based on corticosteroids and anti-tubercular therapy. A partial recovery of motor symptoms, restored sphincter control and permanent blindness are seen in the majority of cases [11].

The long-term clinical efficacy of anti-tubercular therapy in patients with steroid-refractory NMO has been proved. It reduces the disease’s activity and progression, resulting in significant recovery of neurological function [12].

Neuromyelitis optica-like disorders are an important diagnosis to consider in patients treated for active TB who present with acute neurological and ocular disorders such as transverse myelitis and optic neuritis, once neurological TB has been ruled out. Anti-aquaporin-4 antibody screening should be part of the investigation of these patients [3].

Further studies are required to assess whether this association is random or is caused by a dysregulated immune response.

Conflict of interest

All authors declare that there is no conflict of interest.

Authors’ contributions

SZ and AZ made substantial contributions to conception, analysis and interpretation of data. SZ, AZ and HH contributed to drafting the manuscript and revising it critically for important intellectual content. All authors gave final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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