

Commentary

In this issue, readers will encounter the case of a 16-year-old girl who was admitted with acute flaccid quadriplegia with truncal weakness, 1 week after being diagnosed as having pulmonary tuberculosis and being started on antituberculous chemotherapy. The patient was diagnosed as having Guillain-Barré syndrome, acute motor axonal neuropathy variant, and improved after receiving immunoglobulin therapy.^[1]

The clinical presentation of Guillain-Barré syndrome consists of a rapidly progressive symmetrical weakness of the limbs, in a combination of areflexia or hyporeflexia. Sometimes, it can be manifested through cranial nerve involvement, sensory deficit, and ataxia. This is caused by the damage of peripheral nervous system and its barriers. The diagnosis is based on a combination of clinical features, nerve conduction studies, and cerebrospinal fluid analysis.^[2] Guillain-Barré syndrome is a typical postinfectious disorder, which develops 1 month after a respiratory or gastrointestinal tract infection. This disorder is mainly humoral rather than T-cell mediated, driven by molecular mimicry between microbial and nerve molecules (better characterized for axonal variants and Miller-Fisher syndrome; less well understood for demyelinating variants). However, nerve-specific T-cells directed against unknown antigens might play a role in acute neuropathy.^[3] Circulating CD₄⁺-CD₂₅⁺ T-cells (Tregs) were studied in patients with Guillain-Barré syndrome. The number of Tregs was significantly decreased in peripheral blood in the acute stage of patients with Guillain-Barré syndrome and returned toward the level of healthy controls after intravenous immunoglobulin therapy. Therefore, reduced circulating Tregs might be associated with the pathogenesis of Guillain-Barré syndrome.^[4] Interferon gamma was found to induce

Tregs in the presence of anti-CD₃ and anti-CD8 antibodies which might be a candidate for clinical application in patients with Guillain-Barré syndrome.

Primary active disease or reactivation of tuberculosis infection occurs due to a failure of CD₄ T-cell immunity. Macrophages and dendritic cells play a main role in active infection, through the release of proinflammatory mediators (tumor necrosis factor- α , interleukin-1, -6, and -12) and inflammatory chemokines (CCL2, CXCL10), thus recruiting neutrophils, natural killer cells, CD₄, CD₈, and $\gamma\delta$ T- and B-lymphocytes, each of them producing their own complement of cytokines and chemokines to amplify cellular recruitment and remodeling the infection site into the granuloma. As the granuloma progresses to cavitory lesions, an hypoxic environment is facilitated, resulting in uncontrolled bacterial replication, with immune evasion strategies, as described below: Host effector mechanisms are prevented by arresting phagolysosome biogenesis, thus creating an unfavorable intracellular environment.^[5] As *Mycobacterium tuberculosis* is an intracellular pathogen, humoral immunity might have no protective effect or might contribute to immunopathology in active disease. In spite of the demonstration of raised titers of serum antibodies against mycobacterial antigens, no single antigen was universally recognized by serum from patients with active tuberculosis. Some clinical observations suggest an insignificant role for antibodies for tuberculosis, whereas others favor a role for humoral immunity in tuberculosis. In spite of the fact that *M. tuberculosis* strongly stimulates humoral immunity in humans, studies so far have given conflicting results; therefore, more research is necessary.^[6]

The association of Guillain-Barré syndrome and tuberculosis is rare. The clinical picture is to some extent different from

classical postinfectious Guillain-Barré syndrome as it is related to recent or concomitant diagnosis of tuberculosis. Variants may be acute inflammatory demyelinating neuropathy,^[7] acute motor and sensory acute neuropathy,^[8] or axonal motor acute neuropathy.^[1] No specific biomarkers for Guillain-Barré syndrome associated to tuberculosis have been reported up to this point. In view of the limited knowledge of the role of cellular immunity in Guillain-Barré syndrome and the role of humoral immunity in tuberculosis infections, further research is required to determine the link between tuberculosis and Guillain-Barré syndrome.

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REFERENCES

- Vergnon-Miszczyncha D, Suy F, Robert F, Carricajo A, Fresard A, Cazorla C, *et al.* Guillain-Barré syndrome associated with *Mycobacterium bovis* lymphadenitis. *Infection* 2015;43:603-8.
- Wang Y, Sun S, Zhu J, Cui L, Zhang HL. Biomarkers of Guillain-Barré Syndrome: Some recent progress, more still to be explored. *Mediators Inflamm* 2015;2015:564098.
- Willison HJ, Jacobs BC, van Doorn PA. Guillain-Barré syndrome. *Lancet* 2016;388:717-27.
- Chi LJ, Wang HB, Zhang Y, Wang WZ. Abnormality of circulating CD4(+) CD25(+) regulatory T cell in patients with Guillain-Barré syndrome. *J Neuroimmunol* 2007;192:206-14.
- Korb VC, Chuturgoon AA, Moodley D. *Mycobacterium tuberculosis*: Manipulator of protective immunity. *Int J Mol Sci* 2016;17:131.
- Jacobs AJ, Mongkolsapaya J, Sreaton GR, McShane H, Wilkison RJ. Antibodies and tuberculosis. *Tuberculosis (Edinb)* 2016;101:102-13.
- Canham EM, Iseman MD. Guillain-Barré syndrome related to pulmonary tuberculosis. *Ann Am Thorac Soc* 2014;11:855-7.
- Soehardy Z, Yuhansa A, Thein SS, Rohana AG, Fauzi AR, Norlinah MI, *et al.* AMSAN variant of Guillain Barre syndrome progressing to chronic inflammatory demyelinating polyneuropathy in a patient with Marfan's syndrome and pulmonary tuberculosis. *Med J Malaysia* 2005;60:655-6.

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