Intestinal SIgA and Neuro-Inflammation

New evidence that SIgA made in the intestine enters the circulation, reduces CNS inflammation.

Cogence Clinical Pearl

In this Cogence clinical pearl, we look at the role of SIgA in reducing brain inflammation.

What the research says…

In this paper from the journal *Cell*, using the EAE mouse model of MS, researchers show that **IgA producing intestinal plasma cells enter the systemic circulation and migrate to the CNS, where they reduce brain inflammation.** In mice, level of intestinal IgA correlated with level of disease. **In humans, reduction in IgA-bound fecal bacteria is seen in MS patients during disease relapse.**

Application…

This remarkable paper suggests that surveillance of patients' fecal SIgA level may be a crucial marker of the extent to which sufficiency or deficiency of intestinal SIgA production may be contributing to CNS anti-inflammatory or inflammatory. Further, **addressing intestinal SIgA deficiency may present an important opportunity for modulating (down-regulating) neuroinflammation.**

The Research…

Recirculating Intestinal IgA-Producing Cells Regulate Neuroinflammation via IL-10.
Rojas OL, Pröbstel AK, Porfilio EA, et al. Cell. 2019 Jan 24;176(3):610-624.e18.

Abstract

Plasma cells (PC) are found in the CNS of multiple sclerosis (MS) patients, yet their source and role in MS remains unclear. We find that some PC in the CNS of mice with experimental autoimmune encephalomyelitis (EAE) originate in the gut and produce immunoglobulin A (IgA). Moreover, **we show that IgA+ PC are dramatically reduced in the gut during EAE, and likewise, a reduction in IgA-bound fecal bacteria is seen in MS patients during disease relapse.** Removal of plasmablast (PB) plus PC resulted in exacerbated EAE that was normalized by the introduction of gut-derived IgA+ PC. Furthermore, mice with an over-abundance of IgA+ PB and/or PC were specifically resistant to the effector stage of EAE, and expression of interleukin (IL)-10 by PB plus PC was necessary and sufficient to confer resistance. Our data show that IgA+ PB and/or PC mobilized from the gut play an unexpected role in suppressing neuroinflammation.