Persistent Lyme infection or inflammatory immune response?

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The PG(*Bb)* fragments likely "contribute to inflammation during infection and in cases of post-infectious Lyme arthritis." In a mouse study, the authors found "that PG(*Bb)* alone was sufficient to induce acute arthritis."

Furthermore, Jutras and colleagues suggest that "immune responses to PG(*Bb)* and autoantigens may contribute to pathology, even after the infection itself has been cleared." Varying disease severity in patients with Lyme arthritis may be due to differences in specific PG(*Bb)* immune responses, they claim.

[Author's note: Jutras and colleagues assume that the infection has resolved. However, there is no reliable test to show that a Lyme disease infection has cleared.]

Jutras and colleagues raise the question: *How can PG(Bb) material remain in the synovial environment for an extended period (weeks to months) after appropriate antibiotic treatment?*

They propose three possibilities:

1. PG material may be left behind after bacterial killing.
2. Macrophages may store PG in vesicles.
3. PG-containing immune complexes may accumulate in the synovial fluid.

To dampen the immune response to PG(*Bb)*, Jutras and colleagues suggest using "disease-modifying anti-rheumatic drugs, primarily hydroxychloroquine or methotrexate."

In addition, they recommend "targeting innate immune responses with medications, such as TNF or NF-?B inhibitors, for the treatment of such patients."

Lastly, the authors found that *B. burgdorferi* releases PG(*Bb)* fragments during growth, suggesting that "PG(*Bb)* may play a broad role in the multifaceted pathogenesis of Lyme disease beyond Lyme arthritis."

One must ask, however: *Could an active Lyme infection be driving the persistent antigen PG(Bb)*?

The authors did not propose the possibility that PG(*Bb)* material might be caused by a persistent infection. If this was considered, they might have suggested antibiotic treatment rather than immune-modulating therapies.

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References:

1. Jutras, B. L., et al. (2019). "Borrelia burgdorferi peptidoglycan is a persistent antigen in patients with Lyme arthritis." Proc Natl Acad Sci U S A 116(27): 13498-13507.

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