

Re-infection with different *B. burgdorferi* strain can cause a super-infection in mice

Tuesday, May 15, 2018

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In their research, [Bhatia and colleagues found evidence that re-infection](#) with the same strain reduces the infectivity of spirochetes in mice. The infectivity of spirochetes that fed on mice infected with the same strain was dramatically reduced but not eliminated.

However, re-infection with a different strain increased the infectivity of the spirochete. When infected with “different strains of *B. burgdorferi*, blood ingested by feeding ticks enhances the spirochete's ability to re-infect the host,” the authors explain.

In other words, ticks and animals run the risk of a super-infection if they are re-infected with a different strain of *B. burgdorferi*. “Super-infection is defined as the introduction of *B. burgdorferi* into a mouse host that already harbors an ongoing, active *B. burgdorferi* infection,” explains Rogovskyy from Washington State University. [2]

“In nature, multiple strains of *B. burgdorferi* co-exist in the same endemic area,” explains Bhatia, “and a high proportion of reservoir hosts are infected, sometimes with multiple strains.”

In nature, people can be infected with different strains. “Previous studies have demonstrated that Lyme disease patients can become re-infected by a different *B. burgdorferi* strain following effective antibiotic therapy,” Bhatia points out.

The authors findings raise two questions:

Could a second bite lead to a super-infection in humans?

Could a vaccine be developed for multiple strains of spirochetes to avoid a super-infection?

Related Articles:

[Study identifies ticks that are most dangerous to humans](#)

[Hundreds of infected ticks found in one yard in Canada](#)

[Cats carry all types of ticks and tick-borne diseases](#)

References:

1. Bhatia B, Hillman C, Carracoi V, Cheff BN, Tilly K, Rosa PA. Infection history of the blood-meal host dictates pathogenic potential of the Lyme disease spirochete within the feeding tick vector. *PLoS Pathog.* 2018;14(4):e1006959.
2. Rogovskyy AS, Bankhead T. Bacterial heterogeneity is a requirement for host superinfection by the Lyme disease spirochete. *Infect Immun.* 2014;82(11):4542-4552.

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