

Single dose prophylactic treatment of a tick bite only prevents a Lyme rash

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The authors cite the 2006 Infectious Diseases Society of America (IDSA) guidelines when making their recommendation that “individuals be treated with a single dose of doxycycline (4 mg/kg in children \geq 8 years of age to a maximum 200 mg and 200 mg in adults)”. [1] Their recommendation applies only to patients meeting the following criteria, “(1) the attached tick is clearly identified as a nymph or adult *I. scapularis*; (2) the tick has been attached \geq 36 hours; (3) local infection rates of ticks with *B. burgdorferi* is \geq 20%; and (4) there are no contraindications to doxycycline.” [3]

The IDSA guidelines adopted the single, 200 mg dose of doxycycline despite the fact that three previous prophylactic antibiotic trials for a tick bite had failed.

The authors fail to mention that the IDSA single dose of doxycycline approach is based on a single study, which only found a reduction in the number of erythema migrans (EM) rashes. “A study by Nadelman et al. found that patients treated with a single dose of doxycycline developed EM manifestation at a lower rate than the placebo group (0.4% compared to 3.2%, respectively),” according to Applegren from the School of Medicine, University of Missouri.

[The review](#) also does not mention the evidence, as put forth by the International Lyme and Associated Diseases Society (ILADS), which finds that a single dose is ineffective in warding off Lyme disease. Such evidence was easily accessible via open access, peer-reviewed journals in PubMed [2], the Journal’s website, [4] and the National Guideline Clearing House. [5]

ILADS 2014 guidelines used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system to conclude that the evidence for a single, 200 mg dose of doxycycline was [“sparse, coming from a single study with few events, and, thus, imprecise.”](#) [2]

There were only 9 EM rashes in the Nadelman study. Nadelman and colleagues were able to reduce the number of rashes from eight to one by prescribing a single 200 mg dose of doxycycline. The “p” value was barely significant at 0.04.

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Nadelman’s study had several other limitations:

1. It was not designed to detect Lyme disease if the rash were absent.
2. The 6-week observation period was not designed to detect chronic or late manifestations of Lyme

disease.

3. It was not designed to assess whether a single dose of doxycycline might be effective for preventing other tick-borne illnesses such as *Ehrlichia*, *Anaplasmosis*, or *Borrelia miyamotoi*.

Today, patients expect to be informed of their treatment options. The recent review in the *Journal of Emergency Medicine* [1] would have been stronger if the authors had disclosed the evidence against using a single, 200 mg dose of doxycycline for prophylactic treatment of a tick bite.

References:

1. Applegren ND, Kraus CK. Lyme Disease: Emergency Department Considerations. *J Emerg Med*, (2017).
2. Cameron DJ, Johnson LB, Maloney EL. Evidence assessments and guideline recommendations in Lyme disease: the clinical management of known tick bites, erythema migrans rashes and persistent disease. *Expert Rev Anti Infect Ther*, 1-33 (2014).
3. Wormser GP, Dattwyler RJ, Shapiro ED et al. The clinical assessment, treatment, and prevention of lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis*, 43(9), 1089-1134 (2006).
4. Cameron DJ, Johnson LB, Maloney EL. Evidence assessments and guideline recommendations in Lyme disease: the clinical management of known tick bites, erythema migrans rashes and persistent disease from Expert Review of Anti-infective Therapy 2014 at <https://www.tandfonline.com/doi/full/10.1586/14787210.2014.940900>. (Last accessed 1/3/16).
5. Evidence assessments and guideline recommendations in Lyme disease: the clinical management of known tick bites, erythema migrans rashes and persistent disease. National Guideline Clearinghouse. Agency for Health Care Research and Quality. Available from: <https://www.guideline.gov/content.aspx?id=49320>. (Last accessed 10/11/15).

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