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 ≤ 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 ≥ 36 hours; (3) local infection rates of ticks with *B. burgdorferi* is ≥ 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: