Background. Lyme disease, the most common tickborne disease in the United States, may be prevented by taking a single 200-mg dose of oral doxycycline after a high-risk bite from a blacklegged tick. Currently, it is not known how Lyme disease post-exposure prophylaxis (PEP) might vary by region and healthcare system. We identified single-dose doxycycline medication orders in three healthcare systems in states with high incidence of Lyme disease and compared associated patient and provider characteristics.

Methods. Electronic health record data during 2012–2016 were obtained from three healthcare systems: Geisinger (Pennsylvania), Marshfield Clinic (Wisconsin), and Mayo Clinic (Minnesota/Wisconsin). Creation of analytic variables and analysis were harmonized across the three sites. Medication orders for single-dose doxycycline ≤200 mg that were accompanied by specific key words or diagnostic codes (e.g., tick bite; Lyme disease prevention) were considered evidence of PEP. Manual chart review was performed from a random subset to evaluate the algorithms used to identify PEP.

Results. Among 2,937,585 patients with at least one medication order or clinical encounter during the study period, 14,102 single-dose doxycycline orders for Lyme disease PEP for 13,172 unique patients were identified. The typical patient receiving PEP was older (mean age 51–58 years), male (56–59%), and non-Hispanic White (81–98%). The annual seasonality of medication orders was bimodal, with peaks occurring during April–July and October–November. The most common encounter setting was an outpatient clinic or urgent care center (80–91%); medication orders after patient phone calls in the absence of an in-person visit occurred frequently (14–19%) in two health systems. Chart abstractions (n=660) revealed instances of PEP prescribed inappropriately (e.g., bite from a non-blacklegged tick; patient with symptoms of acute Lyme disease).

Conclusion. Lyme disease PEP with a single dose of doxycycline was frequently prescribed in healthcare systems where there is a high incidence of Lyme disease. PEP was most commonly prescribed to non-Hispanic Whites over the age of 50 years. Public health initiatives for tickborne disease prevention should include clinician education on the appropriate use of Lyme disease PEP.

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