

Lyme Disease Treatment in the United States: Prescribing Patterns from a Nationwide Commercial Insurance Database, 2016–2018

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INTRODUCTION

- In the United States, most Lyme disease (LD) is caused by the bite of *Ixodes* ticks infected with *Borrelia burgdorferi*.
- Little is known about nationwide prescribing practices for LD, the most common vector-borne disease in the United States.
- LD is a regionally focal disease, with 15 states accounting for ~95% of cases.
- Usual treatment for LD is a single course of a recommended antibiotic lasting 28 or fewer days.
- Non-standard treatment, such as prolonged courses of multiple antibiotics, has been associated with adverse effects, including infectious diarrhea and central venous catheter-associated bacteremia.
- Nevertheless, some providers continue to prescribe long-term antibiotics for patients diagnosed with LD.

METHODS

- The nationwide MarketScan® commercial claims database includes drug claims and diagnostic codes for a commercially insured population treated in an ambulatory setting.
- For outpatient encounters during 2016–2018 in the United States:
 - All individuals with a visit that included a LD diagnosis code and a drug claim within 30 days of the visit for one or more of 12 antibiotics that may be prescribed for LD were included.
 - Each individual was categorized as having received either standard or non-standard treatment during the three-year period.
 - Descriptive and multivariable analyses were performed to compare characteristics of people who received standard vs non-standard treatment.

RESULTS

- 84,769 drug claims for 45,926 individuals met criteria for inclusion. 15% of people treated for LD received non-standard treatment.
- Female gender (OR 1.5, $p < 0.0001$) and age 19–45 (OR 1.3, $p < 0.0001$) were significantly associated with receiving non-standard LD treatment.
- Treatment in low-incidence states (OR 2.2 compared to high-incidence states, $p < 0.0001$) and during non-summer months (OR 2.2, $p < 0.0001$) was more likely to be non-standard.

CONCLUSIONS

- Young and middle-aged women were at the highest risk of receiving non-standard LD treatment.
- Patients treated in low-incidence states and during non-summer months were more likely to receive non-standard treatment, a trend which likely reflects misdiagnosis and overtreatment of LD.
- These findings point to the need for education for both patients and prescribers on the epidemiology, diagnosis and treatment of LD.
- Future studies are needed to further define prescriber and patient factors associated with non-standard LD treatment and related adverse outcomes, as well as their associated costs to patients and to the U.S. healthcare system.

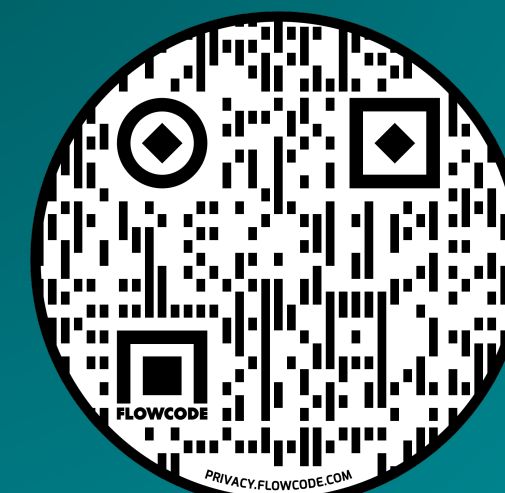
LIMITATIONS

- Study population is limited to commercially insured individuals.
- This study relied on the presence of an ICD-10 code for LD in order to define a treatment episode.
- Some of the antibiotics included in the “standard treatment” category are not currently recommended for LD.
- Our methods likely captured some individuals who were receiving an antibiotic for a diagnosis other than LD.

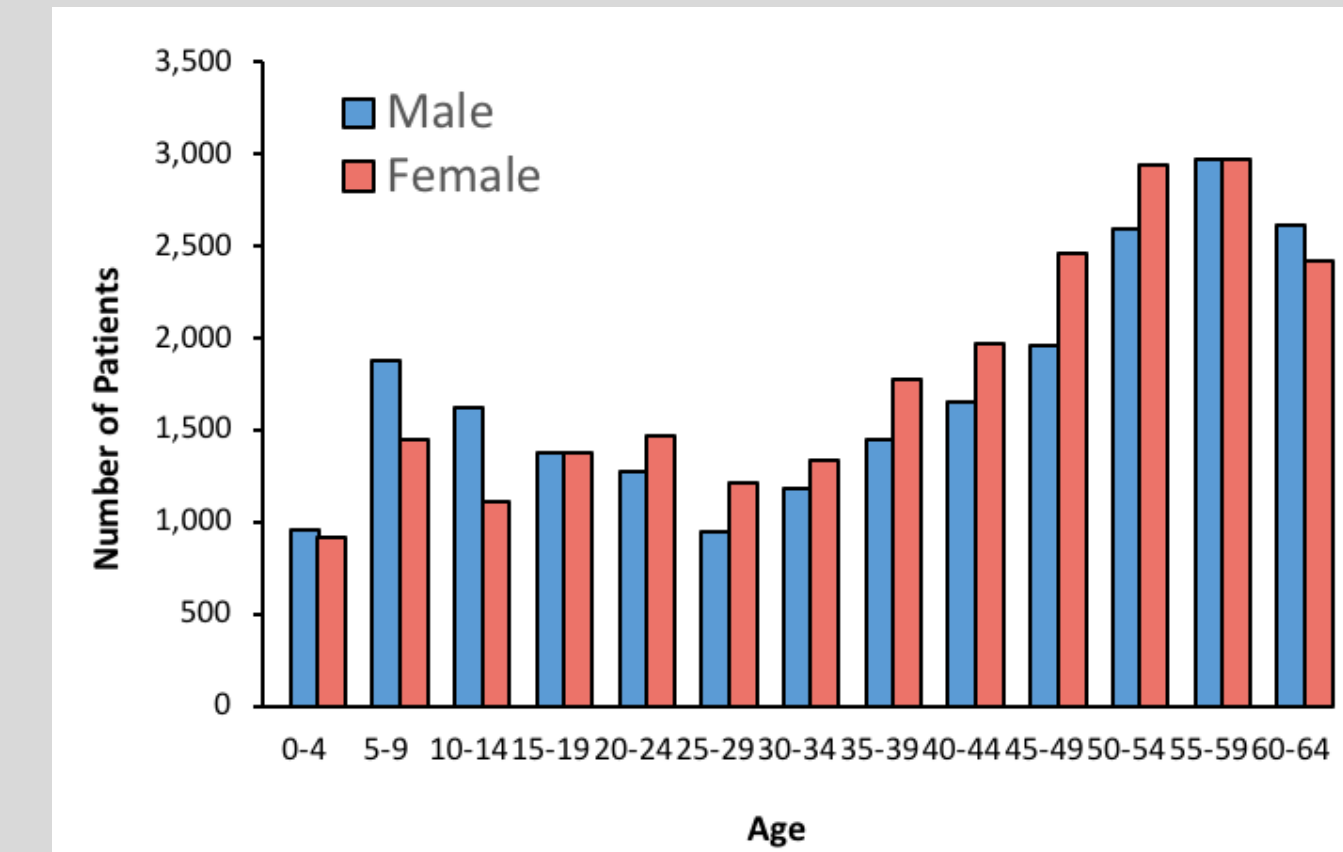
Overtreatment of Lyme disease is common. Young and middle-aged women and patients treated where Lyme disease is rare are at the highest risk for non-standard treatment.

Standard treatment			
Doxycycline	} For no more than 30 days	} With no more than 2 drug claims of these antibiotics within 30 days of outpatient visits with a diagnostic code for LD	
Amoxicillin			
Amoxicillin-clavulanate			
Cefuroxime axetil			
Azithromycin			
Ceftriaxone			
Erythromycin			
Clarithromycin			
Penicillin G			
Cefotaxime			
Non-standard treatment			
Minocycline	OR	Any of the 10 standard antibiotics prescribed within 30 days of an outpatient visit with a LD diagnostic code for a duration of >30 days	OR
Tetracycline			

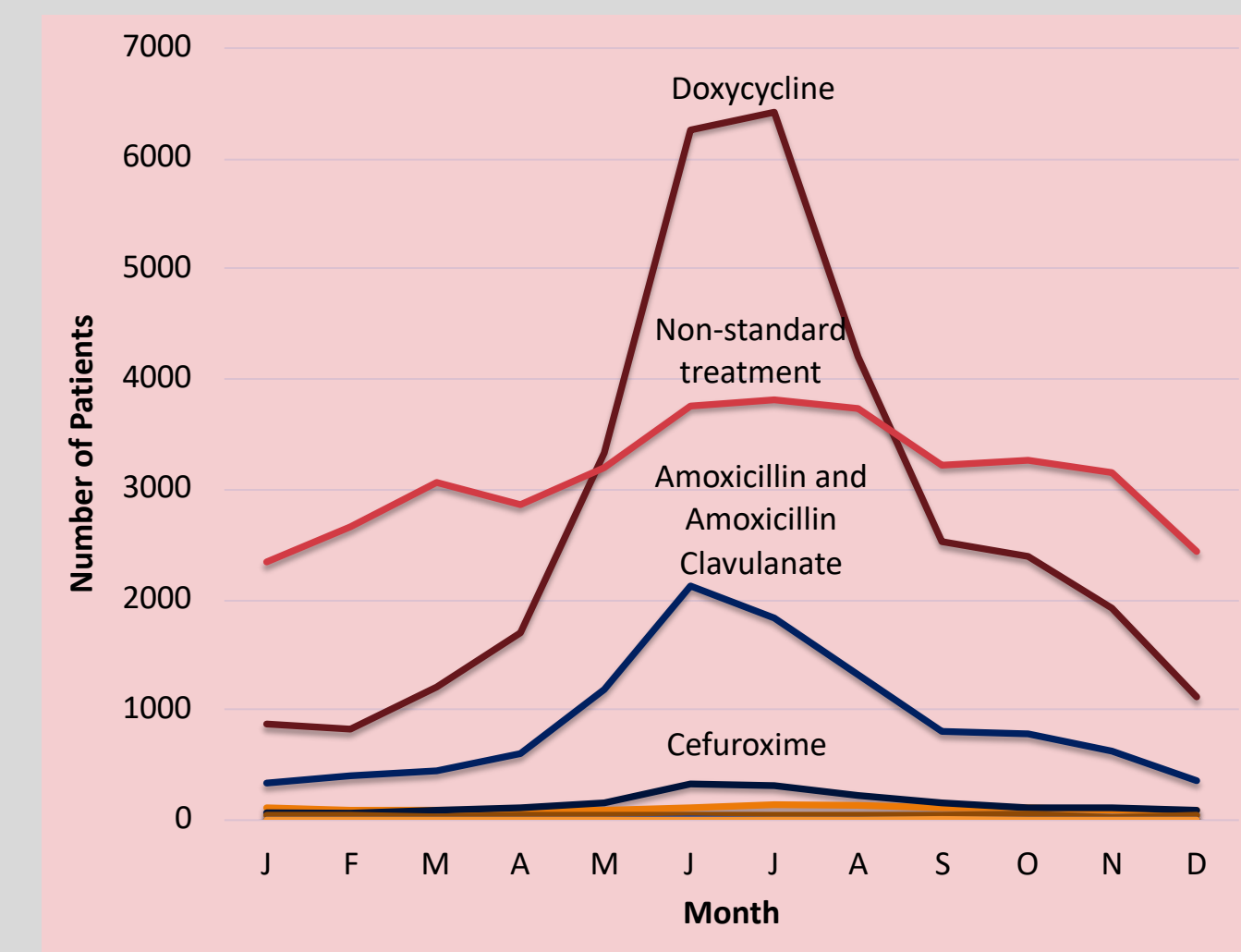
SCAN HERE FOR MORE INFORMATION:



Age and gender distribution of patients receiving treatment for LD



Seasonality of the most common antibiotics prescribed as standard versus non-standard LD treatment



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