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Q: Presentation, Diagnosis, and Treatment of Lyme Disease
Case: 55 y/o homeless F presents to the ED w/ c/o "bug bites and medication refill." On initial evaluation she had several small pruritic, erythematous papules with mild surrounding induration on her upper posterior arms and back. On re-evaluation, these papules had expanded to golf-ball sized nodular lesions. The lesions then developed areas of central clearing consistent with erythema migrans.

Micro Review:
Lyme (Borreliosis) is caused by ***Borrelia burgdorferi****;* infection in humans is caused by 3 genospecies only one of which is found in the U.S. (others are found in Europe and Asia). The disease is transmitted by the ***Ixodes*** **tick**. The tick infects humans at its nymphal stage at which time it's small and therefore patients often do not remember being bitten.

Presentation:
Stage I: **Erythema migrans** – localized infection following incubation of 3-32 days

- d/t outward migration of the spirochete in the skin
- begins as erythematous macule or papule that expands slowly to form an annular lesion. As the lesion expands, the outer edge is bright red and inner circle is cleared. The center may become erythematous and indurated, vesicular, or necrotic.
- The lesions are most commonly found in the thigh, groin, and axilla, but may be found anywhere
- 20% have no rash!

Stage 2: **Disseminated infection** – days to weeks later d/t hematogenous spread in 15% of untreated patients, the spirochete may spread causing any of the following:

- Secondary annular skin lesions
    - Skin involvement usually accompanied by severe HA, mild neck stiffness, F/C, malaise, fatigue
- LAD, splenomegaly, hepatitis, sore throat, non-productive cough, conjunctivitis, iritis, testicular swelling
- Meningitis
- Cranial neuritis
- Radiculoneuritis
- Peripheral neuritis
- Carditis
- AV nodal block
- Migratory musculoskeletal pain
- In US, most commonly fluctuating meningeal symptoms w/ facial palsy and peripheral radiculoneuropathy

Stage 3: **Persistent infection** – months or years later, intermittent or persistent arthritis, chronic encephalopathy, polyneuropathy, acrodermatitis

- 60% untreated develop arthritis
    - Oligoarthritis in large joints

Diagnosis:
PCR; recognition of characteristic skin findings.
Early serologic testing may be negative
Algorithm from American College of Physicians

- High pre-test probability – tx empirically w/o serologies
- Intermediate pre-test probability – serologies and tx if positive
- Low pre-test probability – no serologies, no empiric tx

Treatment:
PO antibiotics unless objective neurological findings or 3rd AV block then IV
Early – **doxycycline**
Other options – **amoxicillin, cefuroxime, erythromycin**
Tx for **14 days** if localized to skin, **21 days** if disseminated.
Abx prophylaxis post-tick bite is controversial

Reference:
Steere AC. Chapter 173. Lyme Borreliosis. In: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson J, Loscalzo J. eds. *Harrison's Principles of Internal Medicine, 18e*. New York, NY: McGraw-Hill; 2012. http://accessmedicine.mhmedical.com.foyer.swmed.edu/content.aspx?bookid=331&Sectionid=40726926. Accessed September 01, 2014