

Post-Lyme Syndrome, an Emerging Complication of Acute Infection with *Borrelia burgdorferi*

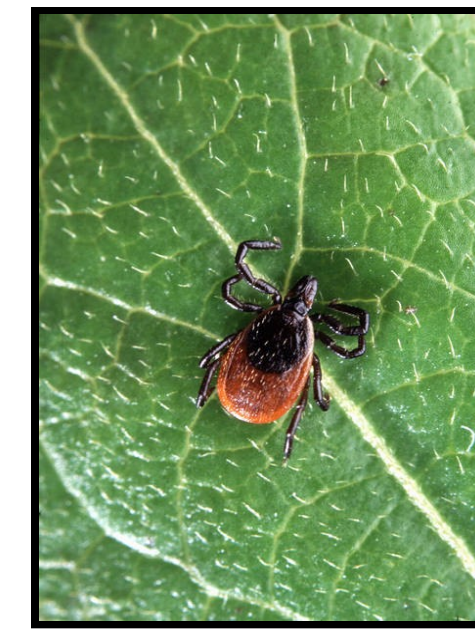
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Background

Lyme Disease

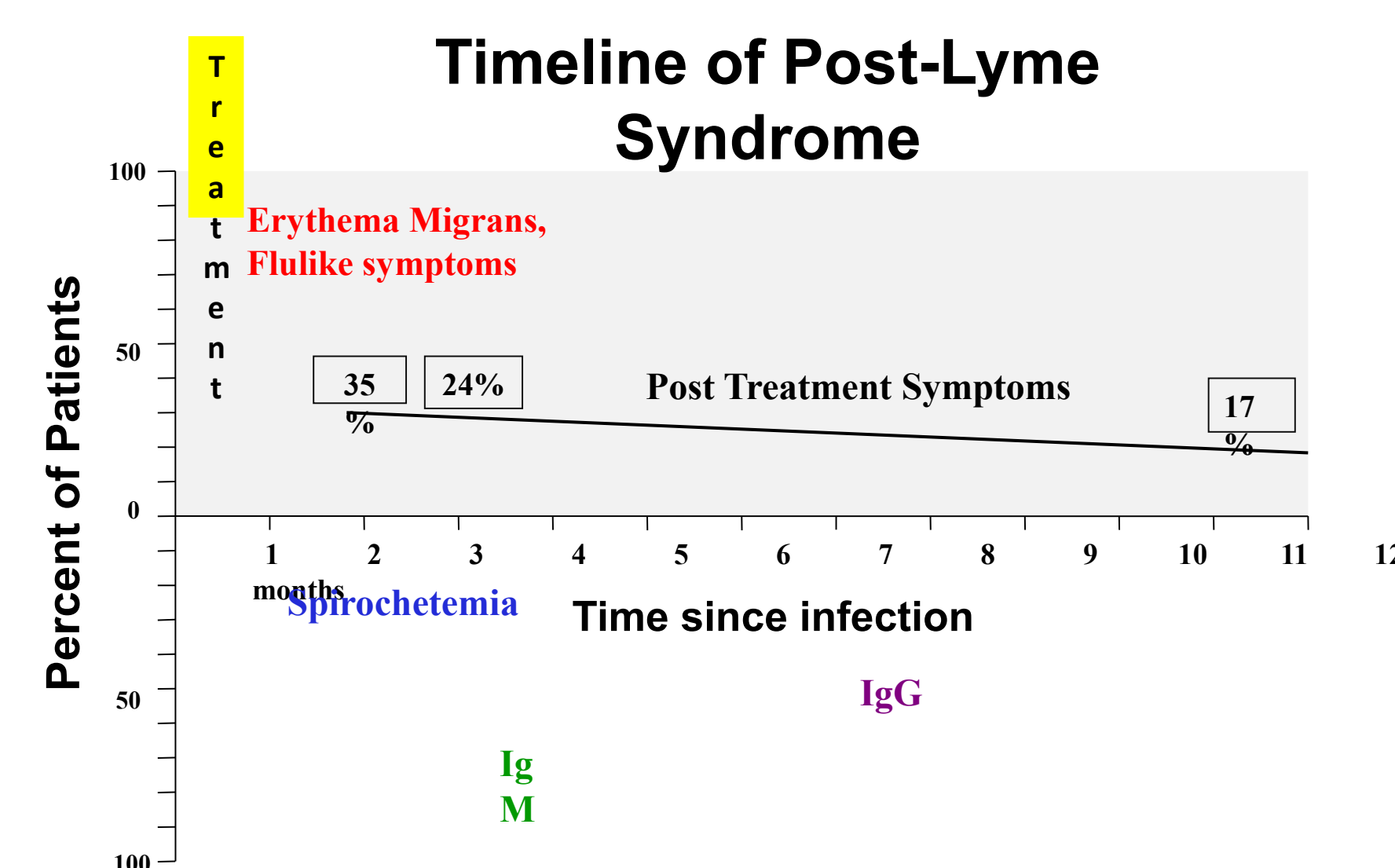
- Emerging infectious disease
- Transmitted through bite of infected tick
- Most common vector-borne disease in the United States
- Treatment of early Lyme disease is highly effective in resolving objective signs of infection



Credit: <http://wikipedia.com>

Post-Lyme Syndrome (PLS)

- A subset of patients, approximately 15-20% of those appropriately treated, develop PLS[1]



- Risk factors include longer duration to treatment and symptoms consistent with neurologic dissemination[2, 3]
- Commonly characterized by persistent or recurring fatigue, musculoskeletal pain, and/or cognitive dysfunction[4]

Study Objective

To explore the magnitude and functional effect of post-Lyme symptoms in patients followed for six months after completion of antibiotic treatment for confirmed early Lyme disease.

References

- Wormser GP, Ramanathan R, Nowakowski J et al. Duration of antibiotic therapy for early Lyme disease: a randomized, double-blind, placebo-controlled trial. *Ann Intern Med* 2003; 138:697-704.
- Shaddick NA, Phillips CB, Logigian EL et al. The long-term clinical outcomes of Lyme disease: A population-based retrospective study. *Ann Intern Med* 1994; 121(8): 560-567.
- Shaddick NA, Phillips CB, Sangha O et al. Musculoskeletal and neurologic outcomes in patients with previously treated Lyme disease. *Ann Intern Med* 1999; 131:919-926.
- 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. *CID* 2006; 43:1089-1134.

Methods

- Patients with early Lyme disease enrolled in a prospective cohort study in Baltimore County, Maryland
- Participants self-administered standardized symptom surveys at 6 months following treatment completion

Inclusion Criteria

- physician-documented *erythema migrans* rash at enrollment
- systemic symptoms at enrollment
- no prior history of Lyme disease, psychiatric illness, chronic fatigue/fibromyalgia, or other condition considered exclusionary in case definition for PLS[4]

Statistical Analyses

- SAS statistical software (x2, Fisher's Exact, Wilcoxon rank sum)

Results

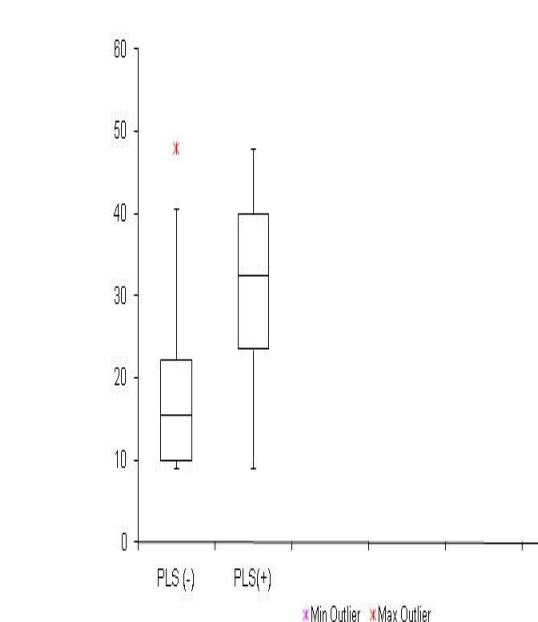
Demographics of PLS

- Eight of the 44 patients (18%) were diagnosed with PLS. No significant differences in demographics by PLS status.

Demographic characteristics by PLS status

	PLS (-) n=36	PLS (+) n=8	p
Percent female	38.9	62.5	0.26
Median Age, years	53.5	46.0	0.94
Median household income	107,500	110,000	0.84
Percent with a college degree or higher	61.1	62.5	1.00

Box plot of FSS score by PLS status



Fatigue

- Evaluated by Fatigue Severity Scale (FSS), a 9-item survey; higher scores indicate higher levels of fatigue.

- Those with PLS had higher median FSS scores (32.5 vs. 15.5, $p=0.05$) than those without PLS.

Depression

- Participants also self-administered the Beck Depression Inventory II (BDI).
- Patients with PLS had significantly higher median scores on the somatic (7.0 vs. 1.0, $p=0.01$) but not the affective (0.5 vs. 0.0, $p=0.22$) subscales of the BDI.

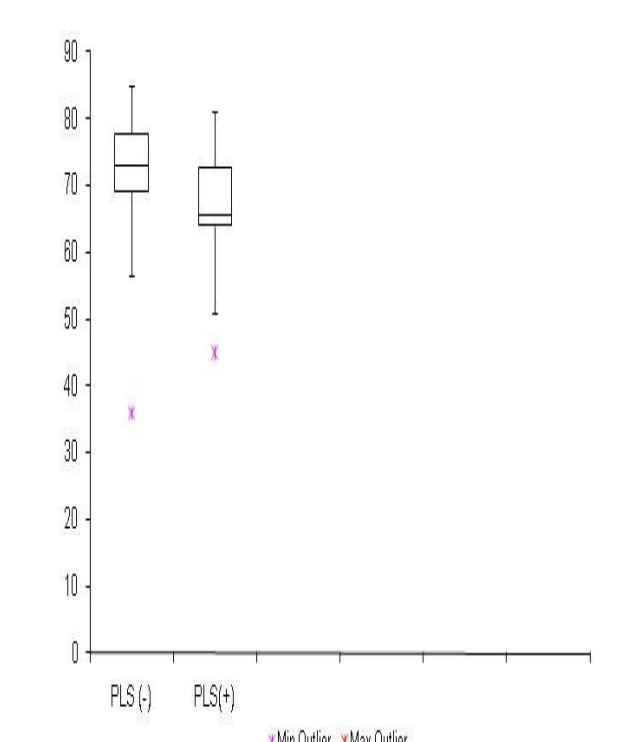
SF-36 Quality of Life

- Significant differences by PLS status were found on 5 of the 8 sub-scales of the SF-36, a 36 item survey to assess health-related quality of life.

Median SF-36 subscale scores by PLS status

Subscale	PLS (-) n=36	PLS (+) n=8	p
Physical Functioning	57.0	52.8	0.01*
Role Physical	56.9	47.1	<.01*
Bodily Pain	55.4	48.6	0.12
General Health	52.9	45.8	0.17
Vitality	58.3	39.6	<.01*
Social Functioning	56.9	48.7	0.02*
Role Emotional	55.9	34.5	<.01*
Mental Health	55.6	44.4	0.12

Box plot of LEC score by PLS status



Prior Life Events

- Evaluated by the Life Events Checklist (LEC), a 17-item survey to assess prior traumatic life events; lower scores reflect a more traumatic history
- No significant differences between groups were found on median LEC scores (73 vs. 66, $p=0.25$).

depression symptoms and decreased quality of life but not a history of prior traumatic life events.

- PLS is associated with significant morbidity and can adversely affect quality of life

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