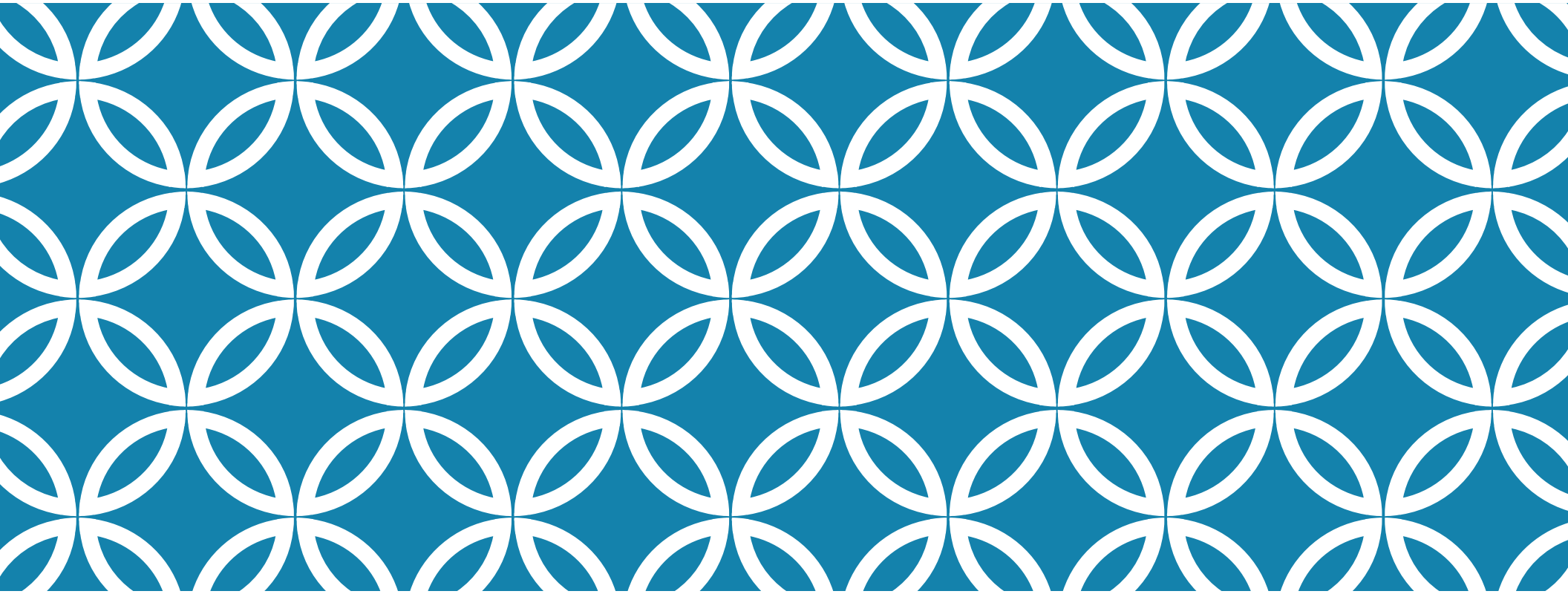

CORRELATION OF LYME DISEASE WITH IMMUNE DYSFUNCTION & REACTIVATION OF OLD VIRUSES

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BACKGROUND

- Lyme disease was first recognized in 1975 after researchers investigated why unusually large numbers of children were being diagnosed with Juvenile Rheumatoid Arthritis in Lyme, Connecticut, and two neighboring towns.
- Most of children lived and played near wooded areas infested with ticks. Most of the symptoms started in summer months. Many reported being bitten by a tick with a rash site.
- Further investigations discovered that tiny deer ticks infected with a spiral-shaped bacterium or spirochete (which was later named Borrelia Burgodeferi) were responsible for the outbreak of arthritis in Lyme.

BACKGROUND

- in the US, a CD4/CD8 ratio ranging from 0.9 to 1.9 is considered to be normal in non-immunocompromised individuals.
- Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks.
- Currently, FDA has approved for two tier testing for Lyme.
- Screening with ELISA
- All positive and inconclusive results should be further tested with Western blot to confirm.
- ELISA is very sensitive. It does not give any information about current or past exposure.

2) RESEARCH FOCUS/GOAL

- to determine if there is a correlation between ***Lyme Disease*** (Western Blot IgG 41 positive) and ***Immune Dysfunction*** (CD4/CD8 ratio)

- Null Hypothesis: There is no correlation between Lyme Disease and Immune Dysfunction.

- Alternative Hypothesis: There is a correlation between Lyme Disease and Immune Dysfunction.

3) METHODOLOGY

- 183 patients at two medical centers were evaluated in two Lyme endemic communities of Maryland, US.
- Patients presenting with clinical features of Lyme in the past three years, with a positive titre were included in the study.
- Retrospective correlational study: for all the patients identified with confirmed Lyme Disease, their medical records were used to collect data on their Immunological tests, including a IgG and IgM panel, CD4/CD8 ratio, and the presence or absence of Ehrlichia, Bartonella, and Babesia microorganisms.
- Patients with Lyme Disease, but without a full Immunological panel done for each episode of illness, were excluded from study.
- Further investigation of 148 of these patients correlated CD4/CD8 ratio and their IgG 41 band, using both a one and two tailed Statistical tests.

4) STATISTICAL RESULTS

- The mean CD4/CD8 ratio in the 148 patients was 2.41; with a variance of 1.05 and a standard deviation of 1.025.
- Assuming a normal CD4/CD8 ratio of less than 2, with a 5% confidence interval, the p value on both a one tailed and two tailed test was shown to be p=**0.00001.**
- **The p-value was very statistically significant** (less than 0.05), thus there was enough evidence to reject the null hypothesis, that there is no correlation between Lyme Disease and Immune Dysfunction.
- Two patients with an initial CD4/CD8 ratio of 2.7 and 2.8 who were IgG 41 positive were subsequently tested with the Nanotrap Urine PCR and found to be positive for Lyme.

ADDITIONAL FINDINGS

- Many patients complained of extreme exhaustion as a symptom (staying in bed)
- In the cohort that was both IgG 41 positive and with altered CD4/8 ratio we ran viral titers for EBV and HHV6
- 55 of the 148 patients had viral titers run
- 41 had markedly elevated Ig G to EBV
- 38 had markedly elevated Ig G to HHV6
- Those with highly elevated EBV titers were treated with Valganciclovir/ Valacylovir.
- The majority of those treated with Valganciclovir felt better.

DISCUSSION AND IMPLICATIONS

- Overall, the alternative hypothesis was supported by this research: in that there **is** a correlation between Lyme Disease and Immunological Dysfunction (which can have future implications for including Immunological testing as part of routine Diagnostic protocol for detecting Lyme Disease in patients).
- Decreased CD4/CD8 ratio with a positive IgG 41 band appears to be a strong predictor of a subsequent diagnosis of Lyme disease despite current diagnostic guidelines.
- This is evidenced by the progression of patients who did not meet current CDC diagnostic guidelines to “neurolyme”, but presented with full blown involuntary movements, hallucinations and subsequent thirst episodes.

HISTORICAL PERSPECTIVE

1

Lyme was initially termed as a" Rheumatoid arthritis type picture" in tick borne in 1975 there was a limited understanding of the role of CD4 and CD8 T lymphocytes then.

2

Rheumatoid Arthritis today is recognized as an auto-immune condition with a decreased CD8 count clinically causes the body to attack itself manifesting in synovial joint degradation and pain.

3

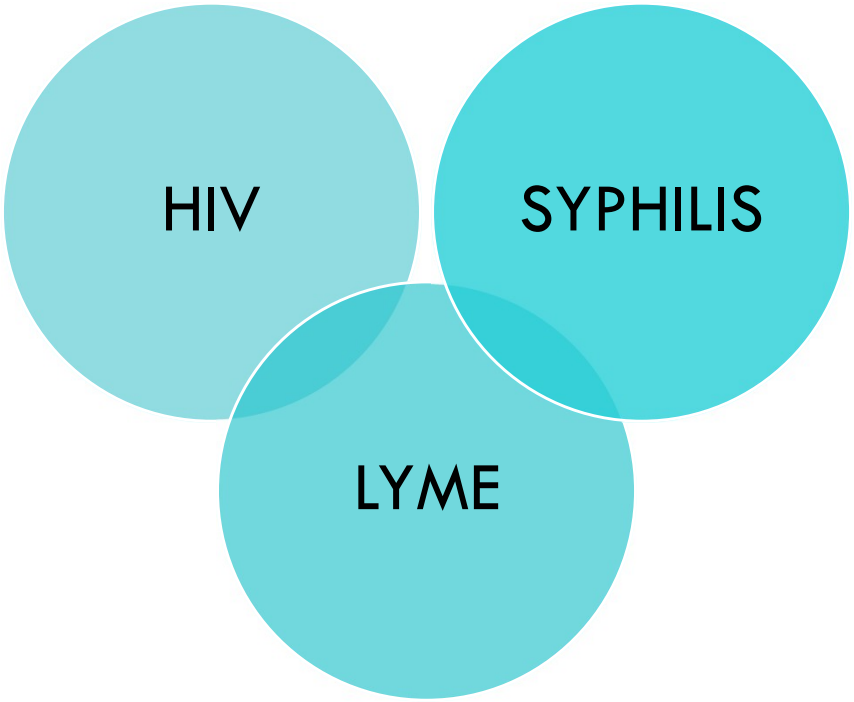
Syphilis a fellow spirochete & cousin to Lyme.

Lyme has many clinical correlates including Argyll Robertson Pupil, Keratitis.

4

HIV affects CD4 function and the correlation of EBV with Kaposi Sarcoma is well recognized.

CLINICAL CORRELATES



6) TAKE HOME POINTS

- ❑DO A 3 POINT LYME TEST
- ❑CONVENTIONAL WESTERN BLOT
- ❑CD4, CD8 AND CD4/8 RATIOS LIKE HIV MEDECINE
- ❑VIRAL TITERS FOR EBV AND HHV6

- ❑CAVEATS

YOUNG HAVE GOOD IMMUNE RESPONSE HENCE THIS CD4/8 RATIO MAY NOT BE VALID

OLDER INDIVIDUALS WHO WERE NEVER EXPOSED TO EBV IN ASOLESCENCE WILL HAVE NEGATIVE TITERS(EXCEPT THOSE WHO MIGHT HAVE SHARED DRINKS)