Syphilis and History of Stillbirth in the US Women's Interagency HIV Study, 1994-2015

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Introduction

- Primary and secondary syphilis rates have increased steadily in US women since 2013 and congenital syphilis cases are at a 20-year high.
- A more nuanced understanding of risk is needed to inform clinician screening and counseling strategies.

Study Aim

- We designed this retrospective study of women living with and without HIV to test the hypothesis that syphilis seropositivity is a marker for prior stillbirth.

Methods

Population: Women living with HIV and those at risk for HIV acquisition with prior pregnancies that were enrolled in the multisite US WIHS Cohort Study between 1994 and 2015 were included. Women were screened for syphilis using rapid plasma reagin (RPR) and confirmatory treponemal antibody testing.

Definitions: Prevalent syphilis was defined as a positive RPR screen with confirmatory treponemal antibody testing at baseline and incident syphilis was defined as a newly positive RPR screen with confirmatory testing during follow up. Prior stillbirth was self-reported.

Statistics: Chi-square tests were used for comparisons of categorical variables while ANOVA or the Kruskal-Wallis test was used for continuous variables. Univariate logistic regression was performed to identify independent risk factors for prior stillbirth. Logistic regression with backward selection was used to create adjusted models for stillbirth.

Results

- 3,592 US women with syphilis testing and prior birth history were included. 4.6% of women reported a prior stillbirth.
- History of stillbirth was more common among women with syphilis compared to those without, 7.1% vs 4.4%; p=0.05 (Figure 1).
- Predictors of stillbirth in the unadjusted model (p<0.05) included black race, older age, and earlier sexual debut (Table 1).
- In multivariable models, syphilis (OR 1.7, 95% CI 1.0-2.9), HIV-negative versus HIV-positive status (OR 1.5, 95%CI 1.1-2.1), older age (OR 1.04, CI 1.01-1.06), and earlier sexual debut (OR 0.95, 95%CI 0.91-0.99) were associated with history of stillbirth (Figure 2).

Women with syphilis had a nearly 2-fold higher odds of prior stillbirth in this cohort study of women with HIV and at-risk for HIV.

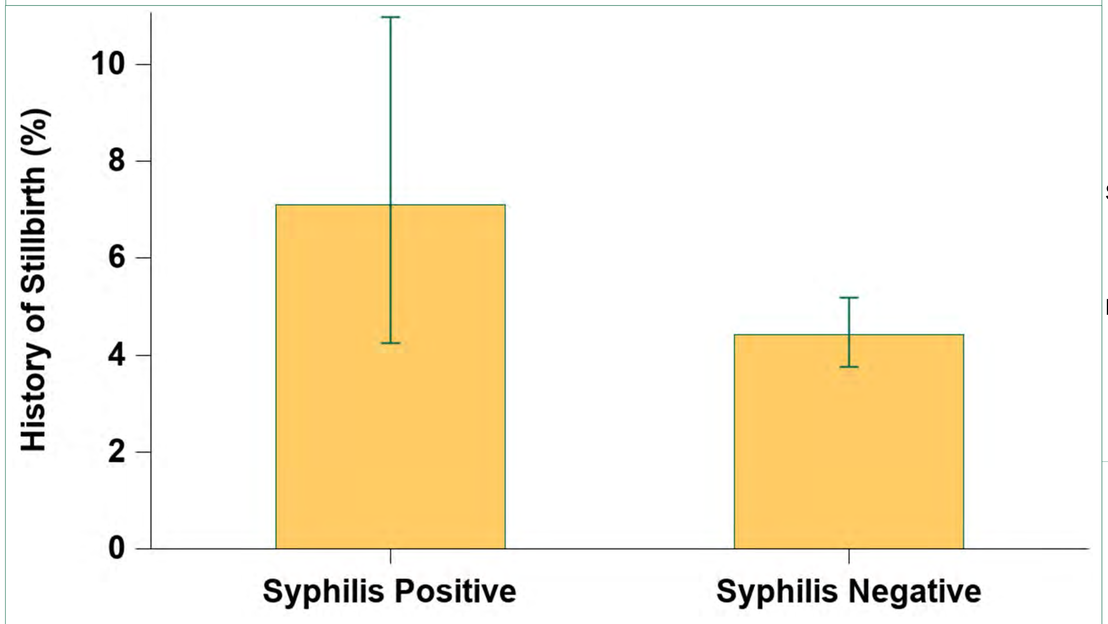

Figure 1. Frequency and 95% Confidence Intervals for History of Stillbirth by Syphilis Serostatus among Women from 18-49 Years old in WIHS

Table 1. Univariate models: Correlates of stillbirth history among women 18-49 years old in WIHS

Variable	Crude OR (95% CI)	p-value
Age (years)	1.03 (1.01-1.05)	0.007
Age at sexual debut (years)	0.95 (0.91-0.99)	0.009
Number of lifetime sex partners (units=10)	1.00 (1.00-1.01)	0.051
Black race	1.46 (1.03-2.05)	0.033
Income <12,000 USD	1.22 (0.87-1.70)	0.249
Lesbian, bisexual, or queer	1.46 (0.95-2.23)	0.082
Single marital status	1.08 (0.78-1.50)	0.634
Syphilis	1.64 (0.99-2.73)	0.055
HIV negative status	1.39 (0.99-1.94)	0.059
Hepatitis C (HCV Ab+)	1.26 (0.90-1.75)	0.172
History of transactional sex	1.15 (0.83-1.58)	0.397
History of miscarriage(s)	1.25 (0.91-1.72)	0.163
Previous sex with a partner living with HIV or IDU	0.85 (0.62-1.17)	0.329
Consistent condom use during sex with a male	0.74 (0.49-1.12)	0.155
Alcohol use of ≥7 drinks/wk	1.04 (0.66-1.63)	0.880
Active/historical use of drugs	1.29 (0.93-1.78)	0.118
Active/historical IDU	1.41 (0.82-2.44)	0.216
Ever incarcerated	1.30 (0.89-1.91)	0.176

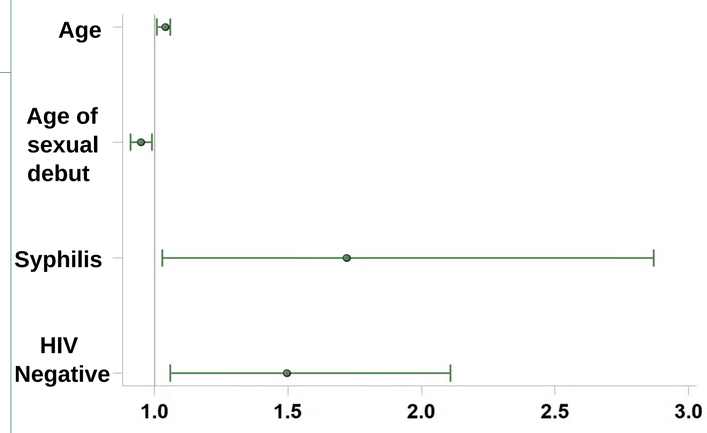

Figure 2. Multivariable Adjusted Odds Ratios and 95% Confidence Intervals for History of Stillbirth among Women 18-49 Years old in WIHS

Conclusions

Syphilis was associated with previous stillbirth in WIHS.

Early prenatal care and universal syphilis screening is critical for US women living with HIV or at risk of HIV.

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