

Chlamydia trachomatis Seropositivity by Age among Women in Uganda and Zimbabwe

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Background

- Chlamydia trachomatis (CT) serum IgG antibodies, if they develop consistently and persist, could provide evidence of past infection for epidemiologic studies.
- Antibodies to chlamydial heat shock protein (cHSP60) have been associated with complicated infection and infertility.
- Few studies have evaluated persistence of either antibody.
- Herpes simplex virus 2 (HSV-2) serostatus is a biomarker of sexual risk. HSV-2 IgG antibodies are known to persist following initial infection, so that seroprevalence in a given cohort reflects cumulative incidence of infection.

Objectives

- To describe CT seropositivity by age among women seeking reproductive health services at selected sites in Uganda and Zimbabwe
- To compare CT seropositivity by age with prevalence of HSV-2 IgG antibodies among these women

Methods

- Analysis of leftover sera obtained for a study of hormonal contraception and HIV risk
- Used baseline sera from a sample of 1088 18-35 year-old women seeking reproductive health services in Uganda and Zimbabwe, from among those study participants who had negative CT PCR cervical swabs (i.e., no evidence of active CT infection) at baseline
- Serologic assays were performed in-country in Uganda and Zimbabwe using commercial test kits:
 - CT major outer membrane protein (MOMP) and cHSP60 IgG: CT-IgG-ELISA plus medac, cHSP60-IgG-ELISA medac
 - HSV-2 IgG: type-specific HerpeSelect ELISA
- Assessed statistical associations using Mantel-Haenszel chi-square and extended chi-square for linear trend

Results

Study Population

	Uganda	Zimbabwe
Total Subjects (N)	558	530
Age Group:		
18-24 years	295 (52.9%)	222 (41.9%)
25-29 years	165 (29.6%)	191 (36.0%)
30-35 years	98 (17.6%)	117 (22.1%)

CT Anti-MOMP IgG Seroprevalence by Study Site:

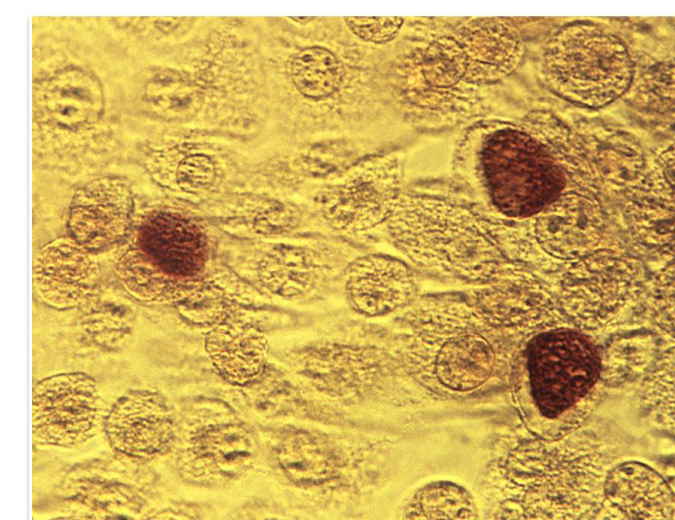
- Uganda: 36.0% (201/558)
- Zimbabwe: 11.9% (63/530)

CT Anti-MOMP IgG Seroprevalence by HSV-2 IgG Serostatus and Study Site

Study Site	Proportion CT Anti-MOMP IgG Positive		P-value*
	HSV-2 Positive	HSV-2 Negative	
Uganda	140/308 (45%)	61/250 (24%)	<0.01
Zimbabwe	45/286 (16%)	18/244 (7%)	<0.01

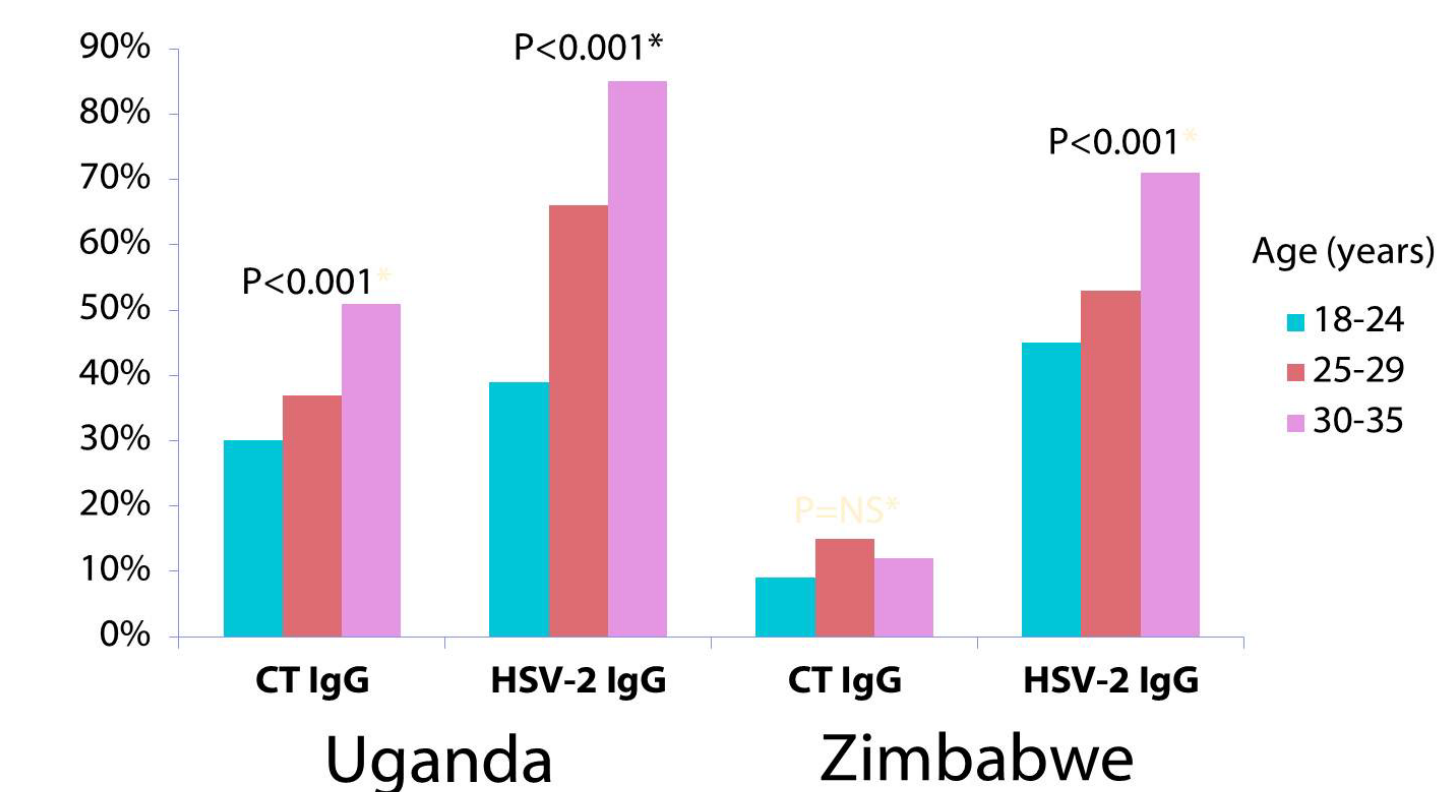
- CT anti-MOMP and HSV-2 seropositivity were associated at both sites.

*Mantel-Haenszel chi-square



CDC/Dr. E. Arum; Dr. N. Jacobs

CT Anti-MOMP and HSV-2 IgG Seroprevalence by Age Group and Study Site



*Extended Mantel-Haenszel chi-square for linear trend

Chlamydia HSP60 Seroprevalence among Women Seropositive for CT Anti-MOMP IgG, by Age Group and Study Site

Age Group	Uganda	Zimbabwe
18-24 years	96/115 (83.5%)	14/23 (60.9%)
25-29 years	60/73 (82.3%)	11/33 (33.3%)
30-35 years	44/59 (74.6%)	5/17 (29.4%)
Total	200/247 (81.0%)	30/73 (41.1%)
P-value for trend*	NS	<0.05

- Among women with CT anti-MOMP IgG, cHSP60 seropositivity trended downward with age in Zimbabwe, but not in Uganda.

*Extended Mantel-Haenszel chi-square for linear trend

Limitations

- Results may not be generalizable to other patient populations.
- Cross sectional data preclude drawing conclusions about the persistence of antibodies in individual participants.

Conclusions

- Seroprevalence of CT anti-MOMP IgG increased with age in Uganda but not in Zimbabwe.
- A high proportion of CT anti-MOMP IgG positive women in Uganda were also cHSP60 positive, which may indicate more severe infection.
- The proportion of CT anti-MOMP IgG positive women who were also cHSP60 positive was lower in Zimbabwe, and varied by age group.

Implications

- Longitudinal assessments of correlates of seropositivity and antibody persistence are needed to determine utility of serologic assays in epidemiologic studies of CT infection and infertility.
- Further analyses of data from this study will examine persistence of CT seropositivity over time in individual women, along with impact of incident infection and sequelae (e.g., pelvic inflammatory disease) on antibody titers.

Acknowledgements

- Jim Braxton, CDC

Abbreviations

cHSP60 = chlamydia heat shock protein 60
 CT = Chlamydia trachomatis
 ELISA = enzyme-linked immunosorbent assay
 HIV = human immunodeficiency virus
 HSV = herpes simplex virus
 MOMP = major outer membrane protein
 PCR = polymerase chain reaction