
More Mungati, MBChB, MPH
Zimbabwe Ministry of Health and Child Care

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Introduction

- Sexually Transmitted Infections (STIs) remain diseases of public health importance
- STIs are co-factors in HIV transmission
- Presence may be a marker of transmission risk
- Knowledge on co-occurrence informs prevention
- Syndromic approach used in Zimbabwe
- Surveillance informs public health action
Introduction

• What are the causes of STI syndromes in Zimbabwe?
• What is the prevalence of HIV among these syndromes?
Broad Objectives

- To determine the current etiology of sexually transmitted syndromes (STIs) in Zimbabwe
Specific Objectives

- To determine the prevalence of different microorganisms among men with urethral discharge syndrome in Zimbabwe
- To determine the prevalence of different microorganisms among women with vaginal discharge syndrome in Zimbabwe
- To determine the prevalence of bacterial vaginosis among women with vaginal discharge syndrome in Zimbabwe
- To determine the prevalence of different microorganisms among men and women with genital ulcer disease in Zimbabwe
Specific Objectives

- To assess the prevalence of HIV among patients presenting with sexually transmitted syndromes in Zimbabwe.

- To assess the prevalence of positive syphilis serology among patients with sexually transmitted syndromes in Zimbabwe.

- To assess the prevalence of urethral/vaginal N. Gonorrhoeae and C. trachomatis co-infection in men and women diagnosed with genital ulcer disease.
Methods

• Study Design: Analytic cross sectional

• Study Population
  - Men with urethral discharge (n=200)
  - Women with vaginal discharge (n=200)
  - Men or women with genital ulcer disease (GUD; n=200)

• Study Setting
  - Harare: Mbare and Budiriro
  - Bulawayo: Khami Road Clinic and Nkulumane Polyclinic
  - Beitbridge: Dulibadzimu Clinic
  - Gutu: Gutu Rural Hospital
Methods

• Data Collection
  - Interviewer administered questionnaire
  - Clinical examination
  - Sample collection

• Data Analysis
  – Stata

• Ethical Considerations and permission
  - Written informed consent
  - MOHCC, MRCZ, RCZ, CDC Atlanta
Methods

• **Laboratory Testing**
  - Samples from genital discharge for Gram-staining
    - Men: urethritis
    - Women: bacterial vaginosis and yeast infections
  - Blood samples
    - HIV testing: First Response; Determine; Chembio
    - Treponemal (SD-DUO rapid) and non-treponemal serology (RPR)
Methods

• Nucleic acid amplification tests (NAAT) for:
  
  • Genital discharge:
    - *N. gonorrhoeae* (NG): Probetec; Gene Xpert, M-PCR
    - *C. trachomatis* (CT): Probetec, Gene Xpert, M-PCR
    - *M. genitalium* (MG): M-PCR
    - *T. vaginalis* (TV): M-PCR
  
  • Genital ulcers:
    - *T. pallidum* (TP): M-PCR
    - *H. ducreyi* (HD): M-PCR
    - *C. trachomatis* (LGV): M-PCR
    - *Herpes simplex virus* (HSV): M-PCR
Results
Results

• Study is ongoing, 416 enrolled
• HIV testing was accepted by 371 (89.7%)
• Of the 371 the following were available for analysis:
  - Treponemal testing: n=360
  - Non-treponemal testing (RPR): n=231
  - Probetec CT/NG: n=250
  - Gene Xpert CT/NG: n=302
  - M-PCR Discharge: CT/NG/MG/TV: n=137
  - M-PCR GUD: TP/HD/CT-LGV/HSV: n=70
### HIV Prevalence by Demographic and STI Syndrome Categories (N=371)

<table>
<thead>
<tr>
<th></th>
<th>HIV Positive</th>
<th>HIV Negative</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Age</strong></td>
<td>33.2</td>
<td>27.2</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td><strong>HIV Positive N(%)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Men</td>
<td>69 (35.8)</td>
<td>124 (64.2)</td>
<td>0.05</td>
</tr>
<tr>
<td>Women</td>
<td>81 (45.5)</td>
<td>97 (54.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shona</td>
<td>66 (36.3)</td>
<td>116 (63.7)</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Ndebele</td>
<td>57 (40.7)</td>
<td>83 (59.3)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>27 (55.1)</td>
<td>22 (44.8)</td>
<td></td>
</tr>
<tr>
<td><strong>STI Syndrome</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male GDS</td>
<td>37 (30.6)</td>
<td>84 (69.4)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>Female GDS</td>
<td>46 (39.7)</td>
<td>70 (60.3)</td>
<td></td>
</tr>
<tr>
<td>Male GUD</td>
<td>32 (44.4)</td>
<td>40 (55.6)</td>
<td></td>
</tr>
<tr>
<td>Female GUD</td>
<td>35 (56.4)</td>
<td>27 (43.6)</td>
<td></td>
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</tbody>
</table>
### STIs Among All Patients by HIV Status

<table>
<thead>
<tr>
<th>NAAT (Gene Xpert)</th>
<th>HIV Positive n (%)</th>
<th>HIV Negative n (%)</th>
<th>OR (95% C. I.)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>N. gonorrhoea</em></td>
<td>46/115 (40.0)</td>
<td>45/153 (29.4)</td>
<td>1.60 (0.98-2.66)</td>
<td>0.07</td>
</tr>
<tr>
<td><em>C. trachomatis</em></td>
<td>14/115 (12.2)</td>
<td>31/153 (20.3)</td>
<td>0.54 (0.27-1.08)</td>
<td>0.07</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Serology</th>
<th>HIV Positive n (%)</th>
<th>HIV Negative n (%)</th>
<th>OR (95% C. I.)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis Treponemal (SD-DUO)</td>
<td>28/145 (19.3)</td>
<td>17/215 (7.9)</td>
<td>2.80 (1.5-5.3)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>Syphilis Nontreponemal (RPR)</td>
<td>15/97 (15.5)</td>
<td>12/134 (8.9)</td>
<td>1.85 (0.82-4.17)</td>
<td>0.12</td>
</tr>
</tbody>
</table>
### Syphilis and Genital Herpes among GUD Patients by HIV Status (n=66)

<table>
<thead>
<tr>
<th></th>
<th>HIV Pos n (%)</th>
<th>HIV Neg n (%)</th>
<th>OR (95% C. I.)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NAAT (Multiplex PCR)</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>T. pallidum (M-PCR)</td>
<td>7/29 (24.1%)</td>
<td>1/37 (2.7%)</td>
<td>11.45 (1.31 - 99.46)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>HSV (M-PCR)</td>
<td>10/29 (34.5%)</td>
<td>6/37 (16.2%)</td>
<td>2.71 (0.85 – 8.60)</td>
<td>0.08</td>
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</tbody>
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HIV Result by Self-Reported HIV Status

Proportion of Participants

Response by Participant

HIV Status +
- HIV Result -
- HIV Result +
HIV Status Unknown
Discussion

• HIV prevalence was >30% in all syndromes
  - Presence of ulcer potentiates HIV transmission

• Positive associations between HIV prevalence and STIs
  - Causal link between HIV and STIs

• HIV found among STI patients with unknown status
  - May be due to reluctance to disclose HIV status
Conclusion

• The association between HIV and incident gonorrhea and syphilis indicates:
  – High risk sexual behaviors leading to both HIV and other STIs
  – High risk of ongoing HIV transmission among those with pre-existent HIV infection and new STI infections

• Patients with STIs should be a major focus of HIV prevention efforts
Limitations

- Incomplete data on lab results
- Only patients with symptomatic STIs studied
- Possible over-sampling of HIV-infected patients
Next Steps

• Complete data analysis
• Correct patient treatment
• Follow up of patients with discrepant HIV results
• Consider large scale study
  – To inform the national STI syndromic management guidelines
Zimbabwe STI Aetiology Study Research Team

- DCM/SEAM/ZiCHIRE
  - Prof. Mufuta Tshimanga
  - Dr. Gerald Shambira
  - Vitalis Kupera
  - Luanne Rodgers

- Ministry of Health and Child Care
  - Dr. Owen Mugurungi
  - Dr. More Mungati
  - Dr. Justice Nyakura
  - Anna Machiha

- U.S. Centers for Disease Control and Prevention
  - Dr. Peter Kilmarx
  - Elizabeth Gonese
  - Amy Herman-Roloff
  - Emma Sizemore

- Consultants
  - Prof. David Lewis
  - Prof. Hunter Handsfield
  - Prof. Kees Rietmeijer
Collaboration

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• University of Zimbabwe, Department of Community Medicine
• United States President’s Emergency Plan for AIDS Relief
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