Sexually Transmitted Diseases in the Biomedical HIV Prevention Era

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Disclosures

• The views expressed herein do not necessarily reflect the official policies of the City and County of San Francisco; nor does mention of the San Francisco Department of Public Health imply its endorsement.

• Gilead Sciences provided study drug and support for drug level testing for the US PrEP demo project.

• Dr. Cohen serves as an unpaid public health advisor to the Gilead HIV PrEP Steering Committee
Roadmap

• Review epidemiology of HIV and STDs among men who have sex with men (MSM)

• Discuss data on impact of PrEP on sexual behaviors and STD incidence

• Reflect on STD prevention in the biomedical HIV prevention era
Epidemiologic Synergy

- 85% of cases of HIV occur through sexual transmission
- STDs increase risk of HIV acquisition and transmission
  - Reduce physical and mechanical barriers to viral entry
  - Increase number and density of HIV-1 receptor-positive cells via inflammation
  - Imbalance of protective vaginal flora
  - Increase HIV concentrations in plasma, genital lesions or secretions

Wasserheit JN STD 1992; Hayes RJ AIDS 2010; Sexton STD 2005
Prior STD = elevated risk for HIV

- MSM with syphilis: 5.6%
- Men with syphilis and subsequent NG/CT/LGV: 7.9%
An Epidemiologic Divide
HIV and STDs in San Francisco, 2002-2015

![Graph showing the number of HIV and STD cases in San Francisco from 2002 to 2015. The graph includes data for Gonorrhea, Syphilis, and HIV. The number of cases is represented on the y-axis, and the years are on the x-axis. The trends show an increase in the number of cases for Gonorrhea and Syphilis, while HIV cases show a decrease.]
Pre-Exposure Prophylaxis and Treatment as Prevention

- Partner-independent HIV prevention methods
  - totally controlled by the user
  - independent of the state of mind immediately prior to and during sex

- Highly effective, *even in the presence of a concurrent STD*

*References*
Liu JAMA Intern Med 2016; Volk CID 2015; Cohen MS NEJM 2011; Champerdon BMC Infect Dis 2015
PrEP and Risk Compensation

- Risk Compensation = Theory that people adjust behavior in response to perceived level of risk
- Has been assessed in regards to bike helmets, seat belts, air bags, condoms, contraception
- One of the most commonly cited concerns about PrEP by clinicians and clients
US PrEP Demonstration Project

- **High** STD positivity rates (26%) at baseline
- 50% had at least one STD during follow-up
- STD rate did not increase during follow-up
Risk Compensation Ipergay (Open Label)

- No change in median number of sexual partners or episodes of anal sex
- Increase in % of receptive anal sex episodes that were condomless
STDs in IPERGAY

### Sexually Transmitted Infections

<table>
<thead>
<tr>
<th></th>
<th>Double-Blind</th>
<th>Open-Label</th>
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<tbody>
<tr>
<td></td>
<td>Median FU: 9.3 months</td>
<td>Median FU: 18.4 months</td>
</tr>
<tr>
<td></td>
<td>n=400</td>
<td>n=362</td>
</tr>
<tr>
<td><strong>Nb Pt (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydiae</td>
<td>81 (20)</td>
<td>122 (34)</td>
</tr>
<tr>
<td>Gonorrhoea</td>
<td>88 (22)</td>
<td>117 (32)</td>
</tr>
<tr>
<td>Syphilis</td>
<td>39 (10)</td>
<td>68 (19)</td>
</tr>
<tr>
<td>HCV</td>
<td>5 (1)</td>
<td>5 (1)</td>
</tr>
<tr>
<td><strong>All STIs</strong></td>
<td>147 (37)</td>
<td>210 (58)</td>
</tr>
<tr>
<td><strong>Nb Cases</strong></td>
<td>114</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>123</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>287</td>
<td>415</td>
</tr>
</tbody>
</table>

### Incidence rate of first STI

35.2 vs 40.6 per 100 PY in the double-blinded and OLE phases
KP RISK COMPENSATION DATA

CHANGES IN REPORTED CONDOM USE AFTER STARTING PrEP (n=143)

- NO CHANGE: 56%
- FEWER CONDOMS: 41%
- MORE CONDOMS: 3%

Volk et al. CID 2015

Rectal CT

Urethral GC

Marcus JL, JAIDS 2016
What do people want from sex and PrEP?

And its one of these things where I have to look at my own personal life and it’s a balance. So I know I’m putting myself at risk for an STD, in fact I expect that at some point I will get one but after spending 30 some odd years of being safe and being terrified, I finally feel like I have an enjoyable sex life and the possibility transmitted infections is very much less significant and important to me.

I know it can happen, I know the risks of them, you know, I’ve had a lot of education throughout my life and I know what the potential risks are. In fact, I expect that at some point I will get one but after spending 30 some odd years of being safe and being terrified, I finally feel like I have an enjoyable sex life and the possibility transmitted infections is very much less significant and important to me.

What do people want from sex and PrEP?

- Pleasure
- Intimacy
- Trust
- Reduced anxiety around sex
- Agency and empowerment
- Lessened stigma

- “When it comes down to it, it happens. It’s a part of sex...It’s a concern, but I know it’s going to happen, I know the way to treat it, and you move on from there.”

- “It’s just like, go get tested every 2 months or so. If you have something, they’ll treat it right away and then it’s gone and then nothing happened, you know what I mean? There’s like, no change whatsoever. So why worry about it?”


SFDPH MSM Focus Groups 2014
More partners = more connectivity

In largest component:
- 2%

In largest bicomponent:
- 10%
- 41%
- 64%

Mean:
- 1.68
- 1.74
- 1.80
- 1.86

Number of partners in red:
- 0.2 more partners per person
- 12% more people have a concurrent partner
- 62% more people connected

Difference:
Despite high rates of STDs, few HIV infections in setting of PrEP
Kaiser Cohort: High rates of STI infections, but no HIV infections on PrEP

STI Incidence After 12 Months of PrEP Use

Volk J, CID 2015
US PrEP Demo Project: High rates of STIs, very few HIV infections

- Despite high incidence of STIs, very low incidence of HIV
- Only 2 HIV infections – both with low/undetectable drug

<table>
<thead>
<tr>
<th>Infection</th>
<th>Incidence (per 100 PYs)</th>
</tr>
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<tbody>
<tr>
<td>Gonorrhea</td>
<td>42.8 (95% CI 37-49)</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>48.2 (95% CI 42-55)</td>
</tr>
<tr>
<td>Syphilis</td>
<td>12.4 (95% CI 9-16)</td>
</tr>
<tr>
<td>HIV</td>
<td>0.4 (95% CI 0.05-1.5)</td>
</tr>
</tbody>
</table>

PrEP – Not only for HIV?

• Caprisa 004
  – Intervention: Tenofovir intravaginal gel 12 hours pre and post sexual contact in high risk South African women
    • 55% reduction in HSV-2 seroconversion

• Partners PREP
  – Heterosexual HIV-negative partners in HIV discordant partnerships in Africa randomized to truvada, tenofovir, or placebo
    • 30% reduction in HSV-2 acquisition

Abdool Karim NEJM 2015
Celum Ann Int Med 2014

Slide courtesy Christine Johnson
Counseling about STD Prevention in the Biomedical HIV Prevention Era

- Engage clients in a conversation about their overall sexual health goals
- Emphasize that PrEP does not prevent other STDs
- Recommend q3mo STD screening
- Address other drivers of risk, including substance use and mental health issues
STD Prevention for MSM in the Biomedical HIV Prevention Era

• Screen and treat
  – Express visits; self-collected specimens
  – Point of care tests to decrease time to treatment
  – Provider focused interventions
• Partner treatment

• Condom availability
• Innovation
  – PrEP for STDs?
  – Vaccines
• Decrease stigma
  – LGBTQ rights
  – Decriminalization of HIV
Conclusions

• HIV-negative MSM with rectal STDs or syphilis should be initiated on PrEP
• Some evidence of risk compensation in PrEP demonstration projects and clinical cohorts
  – Does not attenuate the efficacy of PrEP for HIV prevention
  – Reported condom use was declining and STD rates were increasing prior to PrEP
  – # of individuals currently on PrEP not enough to explain all the STD increases
  – PrEP offers opportunities for “prevention synergy”
• Need innovative STD prevention tools and new strategies to motivate clients around STD prevention
Capacity Building Assistance in High-Impact HIV Prevention for Health Departments

Our team includes nationally-recognized experts specializing in **HIV Testing, Prevention for High-Risk Negative Individuals**, and **Policy**.

Our philosophy: Provide **customized, peer-to-peer TA**, with a focus on **engagement** in person and online, by utilizing creative and innovative technologies.

**Contact Us!**
Visit: www.getSFcba.org
Call: 415.437.6226
Email: get.SFcba@sfdph.org
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- Trang Nguyen

- **Study participants**

- **Patients**

- **Early adopters**

- **Getting to Zero PrEP Committee**
Provider Beliefs Cloud Judgment Around Prescribing PrEP

% Medical Students Willing to Prescribe PrEP

- Sustained condom use
- Sustained nonuse
- Planned discontinuation

Reasons for d/c condoms

<table>
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<tr>
<th>Reason</th>
<th>% reporting acceptable</th>
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<tbody>
<tr>
<td>Conception</td>
<td>69%</td>
</tr>
<tr>
<td>Intimacy/emotional connection</td>
<td>23%</td>
</tr>
<tr>
<td>Pleasure</td>
<td>14%</td>
</tr>
<tr>
<td>Sexual functioning</td>
<td>13%</td>
</tr>
</tbody>
</table>

Ppts were more willing to prescribe PrEP to monogamous MSM vs. MSM with multiple partners for 2/3 condom conditions

Adapted from Calabrese S R4P Chicago 2016; Slide courtesy Al Liu
More STDs = More Complicated STDs

Clinical Advisory: Ocular Syphilis in the United States

Updated March 24, 2016

Between December 2014 and March 2015, 12 cases of ocular syphilis were reported from two major cities, San Francisco and Seattle. Subsequent case finding indicated more than 200 cases reported over the past 2 years from 20 states. The majority of cases have been among HIV-infected MSM; a few cases have occurred among HIV-uninfected persons including heterosexual men and women. Several of the cases have resulted in significant sequelae including blindness.

Top News

CDC: Drug-resistant gonorrhea cases found in Hawaii

Associated Press
September 22, 2016

Updated September 22, 2016 8:57am
• In iPrEx, belief in receiving FTC/TDF was not associated with an increase in numbers of RAI sex partners or % of condomless RAI sex partners
STD incidence for MSM on PrEP higher than MSM not on PrEP, but may be due to several factors

<table>
<thead>
<tr>
<th>STIs</th>
<th>MSM using PrEP STI incidence / 100 py</th>
<th>MSM not using PrEP STI incidence / 100 py</th>
<th>Incidence Rate Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any GC infection</td>
<td>37.5</td>
<td>4.2</td>
<td>25.3</td>
</tr>
<tr>
<td>Any CT infection</td>
<td>38.0</td>
<td>6.6</td>
<td>11.2</td>
</tr>
<tr>
<td>Syphilis</td>
<td>14.5</td>
<td>0.9</td>
<td>44.6</td>
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Potential reasons for higher STD rates among PrEP users:
- PrEP cohorts recruit MSM at high risk for STDs
- STD screening more frequent in PrEP cohorts
- STD incidence increasing over time, & PrEP cohorts include more recent samples
- Risk compensation

Kojima AIDS 2016; Jenness S personal communication; slide courtesy Al Liu
STDs among PrEP users in PrEP Demo

% infections for which treatment would have been delayed with q6 month, as opposed to q3 month, screening

Liu JAMA Intern Med 2016; Cohen # 870 CROI 2016
Behavior Change at the Community Level
Average Number of Male Sex Partners in Prior 3 Months Among MSM Patient Visits, SF City Clinic 2007-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Male Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>4.96</td>
</tr>
<tr>
<td>2008</td>
<td>4.92</td>
</tr>
<tr>
<td>2009</td>
<td>4.43</td>
</tr>
<tr>
<td>2010</td>
<td>4.55</td>
</tr>
<tr>
<td>2011</td>
<td>4.96</td>
</tr>
<tr>
<td>2012</td>
<td>5.64</td>
</tr>
<tr>
<td>2013</td>
<td>6.12</td>
</tr>
</tbody>
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National HIV Behavioral Surveillance: San Francisco MSM

Chen Y-H AIDS Care 2016
Modeling suggests regular STI screening/treatment as part of PrEP delivery can reduce STI incidence by preventing onward transmission.

Jenness S, personal communication