Multipurpose Prevention Technologies (MPTs): Developing interventions to simultaneously prevent STIs, HIV and pregnancy

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Multipurpose Prevention Technologies (MPTs): Developing interventions to simultaneously prevent STIs, HIV and pregnancy

2015 World STI & HIV Congress & HIV/AIDS Conference
16 September 2015 – Brisbane, Australia
Outline

- Background
  - Sexually transmitted infections (STIs)
  - Pelvic inflammatory disease (PID)

- The problem
  - Unintended sequelae of STIs

- Global infertility

- Future directions
  - Next Steps
BACKGROUND

Sexually Transmitted Infections (STIs)

**Chlamydia trachomatis**
- Worldwide Cases (2008)
  - Prevalence: 105.7 million
  - Incidence: 100.4 million

**Neisseria gonorrhoea**
- Worldwide Cases (2008)
  - Prevalence: 106.1 million
  - Incidence: 36.4 million

## BACKGROUND:

**World Wide STI Estimates**

<table>
<thead>
<tr>
<th>WHO REGION</th>
<th>TOTAL INCIDENCE ( Millions ) *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Africa</strong></td>
<td>92.6</td>
</tr>
<tr>
<td><strong>Americas</strong></td>
<td>125.7</td>
</tr>
<tr>
<td><strong>South East Asia</strong></td>
<td>78.5</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td>46.8</td>
</tr>
<tr>
<td><strong>Eastern Mediterranean</strong></td>
<td>26.4</td>
</tr>
<tr>
<td><strong>Western Pacific</strong></td>
<td>128.2</td>
</tr>
</tbody>
</table>

*Inclusive of:
1. *Chlamydia trachomatis*
2. *Neisseria gonorrhea*
3. *Treponema pallidum*
4. *Trichomonas vaginalis*

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WHO Regions: Africa and the Americas

AFRICA

Chlamydia trachomatis
Incidence per 1000

Incidence:
- Female: 22.3
- Male: 20.9

Prevalence (%):
- Female: 2.6
- Male: 2.1

Neisseria gonorrhoeae
Incidence per 1000

Incidence:
- Female: 49.7
- Male: 60.3

Prevalence (%):
- Female: 2.3
- Male: 2.0

AMERICAS

Chlamydia trachomatis
Incidence per 1000

Incidence:
- Female: 72.6
- Male: 38.2

Prevalence (%):
- Female: 7.6
- Male: 2.9

Neisseria gonorrhoeae
Incidence per 1000

Incidence:
- Female: 18.5
- Male: 27.6

Prevalence (%):
- Female: 0.8
- Male: 0.7

Multipurpose Prevention Technologies (MPTs): Developing interventions to simultaneously prevent STIs, HIV and pregnancy

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PELVIC INFLAMMATORY DISEASE
Pelvic Inflammatory Disease (PID)

- Pelvic inflammatory disease (PID)
  - Polymicrobial infection of the upper genital tract, predominantly young, sexually active ♀ (15-29 years of age)
  - 10-20% of ♀ with chlamydia and gonorrhea infections will develop PID, if untreated
  - In US: estimated 750,000 cases/year (2012)
    - $2,000/patient
    - $1.5 billion annually

Complications of PID

- **Complications of PID in ♀:**
  - 20% chance of tubal infertility
  - 18% chance of chronic pelvic pain
  - 9% chance of future ectopic pregnancy


Gottlieb SL, Berman SM, Low N. Screening and treatment to prevent sequelae in women with *Chlamydia trachomatis* genital infection: how much do we know? *J Infect Dis*. 2010;201(suppl 2):S156-S167
Complications of PID in Images
PELVIC INFLAMMATORY DISEASE and INFERTILITY
Perspectives on Infertility

- Infertility:
  - When viewed by individuals as “an impairment of function,” that affects their “quality of life,” then an inability to become pregnant, becomes “a disability.”

WHO-World Bank, 2011
Quality of Life and Infertility

- Quality of Life (WHO Definition)
  
  “An individual’s perceptions of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns.”
Table D.1. Prevalence of moderate and severe disability (in millions), by leading health condition associated with disability, and by age and income status of countries

<table>
<thead>
<tr>
<th>Health condition (b, c)</th>
<th>High-income countries (a)</th>
<th>Low-income and middle-income countries (with a total population of 5,460 million)</th>
<th>World (population 6,437 million)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0–59 years</td>
<td>60 years and over</td>
<td>0–59 years and over</td>
</tr>
<tr>
<td>1 Hearing loss (d)</td>
<td>7.4</td>
<td>18.5</td>
<td>54.3</td>
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<tr>
<td>2 Refractive errors (e)</td>
<td>7.7</td>
<td>6.4</td>
<td>68.1</td>
</tr>
<tr>
<td>3 Depression</td>
<td>15.8</td>
<td>0.5</td>
<td>77.6</td>
</tr>
<tr>
<td>4 Cataracts</td>
<td>0.5</td>
<td>1.1</td>
<td>20.8</td>
</tr>
<tr>
<td>5 Unintentional injuries</td>
<td>2.8</td>
<td>1.1</td>
<td>35.4</td>
</tr>
<tr>
<td>6 Osteoarthritis</td>
<td>1.9</td>
<td>8.1</td>
<td>14.1</td>
</tr>
<tr>
<td>7 Alcohol dependence and problem use</td>
<td>7.3</td>
<td>0.4</td>
<td>31.0</td>
</tr>
<tr>
<td>8 Infertility due to unsafe abortion and maternal sepsis</td>
<td>0.8</td>
<td>0.0</td>
<td>32.5</td>
</tr>
<tr>
<td>9 Macular degeneration (f)</td>
<td>1.8</td>
<td>6.0</td>
<td>9.0</td>
</tr>
<tr>
<td>10 Chronic obstructive pulmonary disease</td>
<td>3.2</td>
<td>4.5</td>
<td>10.9</td>
</tr>
<tr>
<td>11 Ischaemic heart disease</td>
<td>1.0</td>
<td>2.2</td>
<td>8.1</td>
</tr>
<tr>
<td>12 Bipolar disorder</td>
<td>3.3</td>
<td>0.4</td>
<td>17.6</td>
</tr>
<tr>
<td>13 Asthma</td>
<td>2.9</td>
<td>0.5</td>
<td>15.1</td>
</tr>
<tr>
<td>14 Schizophrenia</td>
<td>2.2</td>
<td>0.4</td>
<td>13.1</td>
</tr>
<tr>
<td>15 Glaucoma</td>
<td>0.4</td>
<td>1.5</td>
<td>5.7</td>
</tr>
<tr>
<td>16 Alzheimer and other dementias</td>
<td>0.4</td>
<td>6.2</td>
<td>1.3</td>
</tr>
<tr>
<td>17 Panic disorder</td>
<td>1.9</td>
<td>0.1</td>
<td>11.4</td>
</tr>
<tr>
<td>18 Cerebrovascular disease</td>
<td>1.4</td>
<td>2.2</td>
<td>4.0</td>
</tr>
<tr>
<td>19 Rheumatoid arthritis</td>
<td>1.3</td>
<td>1.7</td>
<td>5.9</td>
</tr>
<tr>
<td>20 Drug dependence and problem use</td>
<td>3.7</td>
<td>0.1</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Van der Poel, 2015, Mumbai, India
1 in 4 couples in developing countries – suffer from infertility

Van der Poel, 2015, Mumbai, India
Primary infertility (childlessness)

Highest prevalence within low and middle income countries
2010 - as a DISABILITY (weight-adjusted)

WOMEN Age > 20-44; Consistent partnership without contraception, and actively trying for a child for 5 years *without a live birth.*

Fertility surveys, mainly self-reports

Secondary infertility (childlessness)
Highest prevalence within low and middle income countries, 2010 - as a DISABILITY (weight-adjusted)

WOMEN Age > 20-44; Consistent partnership without contraception, and actively trying for a child for 5 years after having had one live birth. Fertility surveys, mainly self-reports

CHALLENGES IN STI AND FERTILITY SCREENING
STI AND FERTILITY SCREENING

- Low-resource environments:
  - Syndromic screening and management of STI is suboptimal
    - Point of care (POC) STI screening
  - No established programs and recommendations for partner treatment to prevent persistent or recurrent STI
    - In US – Expedited partner therapy (EPT) or patient-delivered partner therapy (PDPT)

- Fertility awareness


TREATMENT AND PREVENTION OF STIs
The GOAL for Women Worldwide

- Partner treatment and referral for STI screening:
  - POC STI Screening
  - Prevention of STI-related sequelae

- Consideration of multipurpose prevention technologies (MPT) for:
  - Prevention of STIs (chlamydia, gonorrhea, trichomonas, HIV)
  - Prevention of unintended pregnancy
  - Facilitation of planned pregnancy, when desired
NEXT STEPS
Making the Case: Expanding the MPT Agenda

Reproductive Life Cycle

Access to Contraception

Fertility Planning
Women in Control: Reproductive Choice

“Reproductive health, therefore, implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so.”
The future:

- Research funding
  - Develop and investigate new technologies that support:
    - STI/HIV prevention
    - Unintended pregnancy
    - Preserve fertility
Reproductive Right

“The right of men and women to be informed of and to have access to safe, effective, affordable and acceptable methods of fertility regulation of their choice, and the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant.”
Acknowledgments

- Sheryl van der Poel, MD, PhD
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- Conference/Track Organizers