Methamphetamine and HIV: Intersecting epidemics among MSM

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What’s new?

- Update epidemiology of MSM methamphetamine use
- Describe relationship between methamphetamine use and HIV risk among MSM
- Describe current and potential future methamphetamine/HIV prevention research among MSM
# Methamphetamine use among MSM

**CDC National HIV Behavioral Surveillance Survey**

<table>
<thead>
<tr>
<th>Site</th>
<th>Meth use</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Last 12 months</td>
<td>Weekly or more</td>
</tr>
<tr>
<td>San Francisco</td>
<td>21%</td>
<td>6%</td>
</tr>
<tr>
<td>Miami</td>
<td>18%</td>
<td>NA</td>
</tr>
<tr>
<td>San Diego</td>
<td>15%</td>
<td>NA</td>
</tr>
<tr>
<td>New York</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>13%</td>
<td>4%</td>
</tr>
<tr>
<td>Chicago</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Baltimore</td>
<td>7%</td>
<td>3%</td>
</tr>
</tbody>
</table>
Characteristics of meth users, SF NHBS

- No difference in prevalence of meth use by race/ethnicity
- 66% reported meth use during recent sex
- 8% were injectors
- 93% also reported using poppers or cocaine
- 24% had ever sought meth treatment
Methamphetamine and HIV risk

Sexual Risk Behavior

STD/ HIV Risk

OR

0 1 2 3 4 5 6 7

Molitor 1998
Colfax 2001
Purcell 2001
Rusch 2004
Celetano 2005
Mansergh 2006
Morin 2005
Schwarcz 2007
Page-Shafer 1997
Molitor 1998
Chesney 1998
Wong 2005
Hirshfield 2004
Buchacz 2005
Koblin 2006
Ostrow 2007
Harawa 2004

Methamphetamine and HIV risk
Methamphetamine and HIV seroconversion

EXPLORE study results

<table>
<thead>
<tr>
<th>Risk factor for HIV</th>
<th>AHR</th>
<th>95% CI</th>
<th>Attributable fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methamphetamine use</td>
<td>1.9</td>
<td>1.4-2.6</td>
<td>16</td>
</tr>
<tr>
<td>URA with HIV+</td>
<td>3.4</td>
<td>2.2-5.1</td>
<td>18</td>
</tr>
<tr>
<td>URA with unknown status</td>
<td>2.8</td>
<td>2.1-3.8</td>
<td>28</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>2.5</td>
<td>1.4-4.2</td>
<td>4</td>
</tr>
</tbody>
</table>

How can methamphetamine use be independently associated with HIV infection?

- Unmeasured behavioral confounders
  - More traumatic sex
  - Partner selection
    - More likely to be HIV-positive
  - Biased reporting

- Direct biologic effects
  - Impaired T-cell responses
  - Pro-inflammatory
  - Increased viral load
Non-adherence due to methamphetamine use

- 100% of meth users claimed that their meth use had an effect on adherence

Reback, 2004
Methamphetamine is associated with primary drug resistance

- OPTIONS cohort
  - 400 SF MSM with recent HIV infection
  - 27% reported meth use in 30 days prior to enrollment
  - Meth use independently associated with primary NNRTI resistance (Adj OR 3.5, 95% CI 1.2-10.8)

Colfax, Hecht, Grant, et al, AIDS 2007
Interventions for methamphetamine users

- Approaches
  - Counseling
  - Contingency management
  - Pharmacologic
  - Structural
Counseling for meth dependence is associated with reduced meth use

- MATRIX intervention
  - Meth-dependent persons in treatment programs
  - Relapse prevention model
  - Primarily heterosexuals

- 56 behavioral sessions vs. standard outpatient treatment

- Compared with standard treatment:
  - Meth use decreased more in intervention during active phase
  - Similar reductions in meth use in standard and intervention arms at 6-month follow-up

Rawson, 2004
Risk behavior declines among MSM in meth behavioral interventions

Mean number of episodes of unprotected insertive anal sex

CBT  n = 40
GCBT  n = 40

Shoptaw 2005
MSM in contingency management reduce risk

Mean number of episodes of unprotected insertive anal sex

Shoptaw 2005
Will a behavioral risk-reduction approach work among diverse SUMSM?

- Project MIX
  - Multi-site CDC collaborative intervention
  - 1198 SUMSM enrolled
    - 62% men of color
  - Randomized 6-session group intervention
  - Not targeted to treatment-seeking MSM
- Primary outcome: sexual risk behavior
Behavioral interventions

Challenges

- How efficacious are they?
  - To date, small sample sizes among MSM
  - Unknown what degree of behavior change is necessary to reduce HIV infection rates
  - Are behavioral effects sustained?

- Feasibility

- Generalizability
  - Most tested among treatment-seeking populations
  - Can heavy meth users consistently engage in and re-learn healthier behaviors?
Pharmacologic treatment for methamphetamine users

- Failed or unpromising agents: sertraline, amlodipine, imipramine, dextroamphetamine
  - Phase 2 study of bupropion among MSM in progress
    - Safety
    - Adherence
    - Sexual risk
Pharmacologic approaches

- **Mirtazapine (Remeron)**
  - "Dual action" - works on serotonergic and dopaminergic pathways
  - Small RCT in Thai meth-dependent persons
    - Mirtazapine reduced meth withdrawal symptoms
    - Independent of effects on depression
  - Efficacy study among high-risk MSM in progress

Source: Kongsakon 2005
Pharmacologic approaches....

- Aripiprazole (Abilify)
  - "Atypical" antipsychotic
  - D2 partial agonist
    - May prevent meth withdrawal
    - May decrease effects of meth use
  - Some drug discrimination studies show aripiprazole blocks meth’s effects compared with placebo

Sources: Lile 2005; De la Garza, 2005
Pharmacologic interventions

Challenges

- Likely will need to be combined with behavioral therapy for greatest efficacy
  - But very intensive behavioral platforms may overwhelm any detectable drug effects

- Side effects
- Duration
- Cost
Structural interventions

- Increased federal regulation in meth precursors associated with declines in:
  - Meth-related hospital admissions
  - Meth potency
  - Meth-related arrests

- Effects may be transient
  - Will market forces ensure that supply = demand?

Suo 2004, Cunningham 2005
Conclusions and future directions

- **Meth epidemic among MSM continues**
  - High across all areas in US
  - Meth use common, frequent use less so
    - What keeps most MSM from using meth?
    - What causes some MSM to become heavy meth users?

- **Meth use increases risk of HIV infection**
  - Meth about doubles risk
    - Behavioral dis-inhibition
    - Plausible biologic mechanisms

- **Critical need for continued testing of interventions**
  - Distinguish populations: heavy users vs. episodic users; injectors
  - Are effects of interventions sustainable, and will they reduce HIV?
  - Pharmacologic interventions promising, but not proven
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