Initial Findings: Methamphetamine Use & Heart Failure Among Native Hawaiians: The Malama Pu’uwait Study

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Methamphetamine Use & Heart Failure in Native Hawaiians & Pacific Island Peoples

- Background
- Methods
- Results
- Conclusions
- Discussion

Malama Pu‘uwai Study
A Research Partnership: DNHH & QMC
Methamphetamine in the USA

In the West: persistent problem - HIGH areas in:
• Honolulu
• San Diego
• Seattle
• San Francisco
• Los Angeles

Source: Treatment Episode Data Set (TEDS), SAMHSA.

NIDA CEWG early warning network of researchers, 1/2006
What is Methamphetamine?

Methamphetamine, unlike Cocaine, longer duration & larger percentage unchanged in body
Health effects of Methamphetamine

Short-term effects may include:

- Increased attention and decreased fatigue
- Increased activity and wakefulness
- Decreased appetite
- Euphoria and rush
- Increased respiration
- Rapid/irregular heartbeat
- Hyperthermia

Long-term effects may include:

- Addiction
- Psychosis, including:
  - paranoia
  - hallucinations
  - repetitive motor activity
- Changes in brain structure and function
- Memory Loss
- Aggressive or violent behavior
- Mood disturbances
- Severe dental problems
- Weight loss

Recovery of Brain Dopamine Transporters in Chronic Methamphetamine (METH) Abusers

Normal Control  METH Abuser (1 month abstinence)  METH Abuser (24 month abstinence)

Illicit Drug Use Trends in Youth (2005-2008)
Methamphetamine Use Trends in Youth (2005-2008)
Methamphetamine Use & Heart Disease

• Less known effects of MU on CV System
• Minorities at high risk – Western region
  – NHs, Pacific Island Peoples, etc.
• CVD assoc. with Chronic MU
  – Cardiomyopathy & Heart failure
• Heart failure – leading cause of CVD hospitalizations
  – 5.2 million prevalence, $33.2 billion

NIDA, American Heart Association
Risk factors associated with methamphetamine use and heart failure among Native Hawaiians and other Pacific Island peoples

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Karynna Asao2
Jimmy Efird3
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Robert Ratner5
Muhammad Hafiz6
Todd Seto6

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Objective: Heart failure (HF), a long-term outcome of chronic methamphetamine use (MU), occurs more frequently in racial and ethnic minority populations at high risk for cardiovascular disparities. This study examined the association of socio-demographic and clinical risk factors with MU among heart failure patients who are Native Hawaiians (NH) or other Pacific Island peoples (PIP).

Design/Setting/Patient Population: Cross-sectional study of NHs and PIPs with advanced heart failure enrolled in the Malama Pu‘uwai Study, a randomized control trial to test an educational intervention to reduce re-hospitalization and/or death. A total of 82 participants were enrolled between 6/1/06 to 12/31/07 and met the following eligibility criteria: 1) self-identified NH or PIP 2) Left ventricular systolic ejection fraction ≤45%, 3) Age of 21 years or older. Data were analyzed by odds ratios (OR), 95% confidence intervals (CI), and multiple logistic regression analysis.

Main Outcome Measure: Methamphetamine use.

Results: Twenty-two percent of HF participants were identified as being current or prior methamphetamine users. Younger age and non-married status (combined never married or divorced/separated) were independently associated with MU after adjustment for sex, education, and other co-morbidities associated with HF (ie, age ≥50 years, OR = 0.16, 95% CI: 0.03–0.84; non-married status combined as never married OR = 8.5, CI: 1.5–47; divorced/separated OR = 11, CI: 1.8–75).

Conclusions: Risk factors associated with MU in NH and PIPs with heart failure include: younger age and being divorced/separated or never married. Health care providers should be aware of MU as a contributing factor in the approach and treatment of HF in NHs and PIPs.
Malama Pu’uwai Study (MPS)  
Methods

• Randomized Control Trial  
  – Testing HF education to prevent re-hosp/death

• Eligibility  
  – Native Hawaiian or Other Pacific Island People  
  – Advanced heart failure (≤45% Sys Eject Fraction)  
  – age ≥ 21 yr. old  
  – recently discharged from hospital

• For this study: Baseline exam

• N = 82 ppts; Jun 2006 – Dec 2007
# Results – Table 1: Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>+ Meth Use N = 18</th>
<th>- Meth Use N = 64</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yrs)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>6 (33%)</td>
<td>6 (9%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>40-49</td>
<td>6 (33%)</td>
<td>10 (16%)</td>
<td>0.60 (.13-2.7)</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>6 (33%)</td>
<td>48 (75%)</td>
<td>0.13 (.03-.51)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>4 (22%)</td>
<td>22 (34%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>Men</td>
<td>14 (78%)</td>
<td>42 (66%)</td>
<td>1.8 (.54-6.2)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently married</td>
<td>2 (11%)</td>
<td>37 (58%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>Never</td>
<td>10 (56%)</td>
<td>14 (22%)</td>
<td>13 (2.6-68)</td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>5 (28%)</td>
<td>9 (14%)</td>
<td>10 (1.7-62)</td>
</tr>
<tr>
<td>Widow/Widower</td>
<td>1 (6%)</td>
<td>4 (6%)</td>
<td>4.6 (.34-63)</td>
</tr>
</tbody>
</table>
Results – Table 1: Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>+ Meth Use N = 18</th>
<th>- Meth Use N = 64</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High Sch</td>
<td>4 (22%)</td>
<td>10 (16%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>High School/GED</td>
<td>9 (50%)</td>
<td>32 (51%)</td>
<td>.77 (.20-3.0)</td>
</tr>
<tr>
<td>Some College</td>
<td>2 (11%)</td>
<td>18 (29%)</td>
<td>.31 (.05-2.0)</td>
</tr>
<tr>
<td>College degree</td>
<td>3 (17%)</td>
<td>3 (5%)</td>
<td>2.8 (.39-20)</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>16 (89%)</td>
<td>40 (63%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>Pacific Island People</td>
<td>2 (11%)</td>
<td>24 (37%)</td>
<td>.21 (.04-.99)</td>
</tr>
<tr>
<td>Smoke (100 cig/life)</td>
<td>16 (89%)</td>
<td>47 (73%)</td>
<td>2.9 (.60-14)</td>
</tr>
<tr>
<td>Alcohol (+ 12 mon)</td>
<td>13 (72%)</td>
<td>35 (55%)</td>
<td>2.2 (.68-6.8)</td>
</tr>
</tbody>
</table>
## Results – Table 2: Clinical Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>+ Meth Use N = 18</th>
<th>- Meth Use N = 64</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systolic BP (mmHg)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;140</td>
<td>6 (33%)</td>
<td>6 (9%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>≥140</td>
<td>6 (33%)</td>
<td>10 (16%)</td>
<td></td>
</tr>
<tr>
<td><strong>Diastolic BP (mmHg)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;90</td>
<td>16 (89%)</td>
<td>59 (92%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>≥90</td>
<td>2 (11%)</td>
<td>5 (8%)</td>
<td></td>
</tr>
<tr>
<td><strong>BMI (kg/m2)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>2 (11%)</td>
<td>22 (34%)</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>30-39</td>
<td>8 (44%)</td>
<td>18 (28%)</td>
<td></td>
</tr>
<tr>
<td>&gt;39</td>
<td>6 (33%)</td>
<td>17 (27%)</td>
<td>3.9 (.70-22)</td>
</tr>
<tr>
<td>Unknown</td>
<td>2 (11%)</td>
<td>7 (11%)</td>
<td></td>
</tr>
</tbody>
</table>
Results – Table 2: Clinical Characteristics
Heart Failure Status*

<table>
<thead>
<tr>
<th>Heart Failure Status</th>
<th>Meth Users (N=18)</th>
<th>Non-Meth Users (N=64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe (30%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mod-Severe (30-34%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate (35-39%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild-Mod (40-44%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* No significant differences between MU vs. Non-MU
Results: Clinical Characteristics - Co-Morbid Conditions*

<table>
<thead>
<tr>
<th>Condition</th>
<th>Meth User (N=18)</th>
<th>Non-Meth User (N=64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASHD</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>Stroke</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>HTN</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>40%</td>
<td>50%</td>
</tr>
</tbody>
</table>

* No significant differences between MU vs. Non-MU
Results – Table 3: Multivariate Analysis Factors Associated with Methamphetamine Use; N=82

<table>
<thead>
<tr>
<th>Factors*</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 40</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>40 to 50</td>
<td>0.70 (.13-3.9)</td>
</tr>
<tr>
<td>More than 50</td>
<td>0.16 (.03-.84)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
</tr>
<tr>
<td>Currently married</td>
<td>1.0 referent</td>
</tr>
<tr>
<td>Never married</td>
<td>8.5 (1.5-47)</td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>11 (1.8-75)</td>
</tr>
<tr>
<td>Widow/Widower</td>
<td>5.7 (.38-87)</td>
</tr>
</tbody>
</table>

* Adjustment for sex, race/ethnicity, education, alcohol use, ASHD, HTN, DM were not significant confounders to model.
Study Conclusion

- Meth use – common among NH/PIPs with heart failure (22%)

Independent risk factors for Meth Use:
- Older age “protective” factor for Meth Use in NH/PIP with heart failure
- Unmarried status associated with Meth Use in NH/PIP with heart failure
- Limitations – Cross-sectional, sample size
Implications

• Chronic methamphetamine use – “hidden” cause of heart failure in 1 of 5 NHs/PIPs

• Native Hawaiian/Pacific Island People w/ HF
  – Younger (~50 y.o. vs. typical 75 y.o.)
  – Etiology – more HTN, DM than ASHD (compared Whites)

• HF Survival – 40% at 5 years (w/wo EF% preserved)

• Is MU-associated HF reversible compared to other causes of HF?

Miller, Cardiol Clin 26(2008)
Approaches for Reducing Heart Failure Disparities in NHOPIs

• Prevent Chronic Methamphetamine Use
  – Improve Social Support systems
  – Increase Programs to Prevent MU Early (i.e. in Youth)
  – Educational programs to raise awareness of CV effects (among other health effects)

• If HF exists – treatment approaches need to tx
  – Multiple co-morbidities (DM, HTN, etc.)
  – Recognize that MU may also pose challenges to treatment adherence.

Miller, Cardiol Clin 26 (2008)
Malama Pu'uuwai Study: Open enrollment

What’s it all about?
The Malama Pu'uuwai Study is a randomized control trial (RCT) to test the efficacy of a culturally-informed heart failure (HF) education and support program in Native Hawaiians and Pacific Islanders.

The Malama Pu'uuwai Study will be conducted by The Queen's Medical Center and the Department of Native Hawaiian Health at JABSOM.

The intervention includes:
- 4 heart education lessons
- 1. Symptoms management
- 2. Medication management
- 3. Low sodium diet
- 4. Physical activity & emotion & stress management
- 1 year follow-up

Who is eligible?
- Native Hawaiians and Pacific Islanders (for example, Samoans, Tongans, and Marshallese).
- Adults 21 years of age or older.
- Clinical symptoms and signs of heart failure AND LV systolic EF of ≤ 40% OR ≤ 60% and evidence of abnormal diastolic function on echocardiogram.
- Recently discharged (within 2 weeks) from a hospital admission with heart failure (primary or secondary discharge diagnosis).

All 4 criteria required to enroll

What can you do?
Talk to your doctor to see if you are eligible and if you can benefit from the Malama Pu'uuwai Study.

If your doctor or you need more information, contact us at:

Phone: (808) 587-8577
Email: puuwai@hawaii.edu

1 ke 'ai pono ke ola pono
“A healthy life can be achieved by living right.”
Malama Puʻuwai Study
A Research Partnership: DNHH-JABSOM & QMC

Mahalo Piha

John A. Burns School of Medicine
University of Hawaiʻi at Manoa

THE QUEEN'S MEDICAL CENTER
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