Smokeable Cocaine in South America

Dr. Antonio Pascale Prieto

M.D., Toxicologist – REDLA
Montevideo, Uruguay

LI CICAD Regular Session
CICAD - OAS, Washington DC . USA
May 9-11, 2012
Presentation

- Smokeable Cocaine Substances
- The Epidemiology of Cocaine Base Paste (CBP) consumption
- Profile of the CBP user
- CBP: toxicology - health impact
  - Composition
  - Toxicity
  - Addictive Potential
  - Clinical Aspects
  - Chronic complications
- Therapeutic Approach

SMOKEABLE COCAINE

Coca Leaf → Alcohol → COCAINE BASE PASTE → BASUCO (Colombia)

FREE BASE          CRACK

Kerosene
Gasoline
Alkaline Substances
Sulphuric Acid
Hydrochloric Acid
Acetone
Ethanol
Sodium Bicarbonate
Ammonia
Ether
Temp. 800°C

Sodium Bicarbonate
Ammonia
water
Temp. 98°C

Modificada de Castaño, 2000
Epidemiology of CBP consumption

Surveys indicate low prevalence of consumption...

... however impact is high.
(demand for treatment, consultations related to acute and chronic effects)

Consumption in the General Population

<table>
<thead>
<tr>
<th>Country</th>
<th>Lifetime</th>
<th>Past Year</th>
<th>Past Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina (2008)</td>
<td>0.40</td>
<td>0.20</td>
<td>0.10</td>
</tr>
<tr>
<td>Chile (2008)</td>
<td>1.10</td>
<td>0.70</td>
<td>0.40</td>
</tr>
<tr>
<td>Colombia (2008)</td>
<td>1.09</td>
<td>0.17</td>
<td>0.10</td>
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<td>Ecuador (2007)</td>
<td>0.72</td>
<td>0.13</td>
<td>0.10</td>
</tr>
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<td>El Salvador (2005)</td>
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<td>0.08</td>
<td>0.08</td>
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<td>Guatemala (2005)</td>
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<td>-</td>
</tr>
<tr>
<td>Nicaragua (2006)</td>
<td>0.50</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Panama (2003)</td>
<td>0.24</td>
<td>0.14</td>
<td>0.08</td>
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<tr>
<td>Paraguay (2005)</td>
<td>0.14</td>
<td>0.08</td>
<td>0.02</td>
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<td>Peru (2006)</td>
<td>1.30</td>
<td>0.38</td>
<td>0.16</td>
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<td>Uruguay (2006)</td>
<td>0.80</td>
<td>0.30</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Source: NDCs and NDUs in member states
Note: Table displays data available from individual countries. Countries without comparable data may not be represented. Canada and the USA do not collect data on CBP use.
Numbers in ( ) indicate year of study.

Report on Drug Use in the Americas. OID. CICAD. OEA (2011)
IV National Household Survey (2006) – Consumption of CBP in Uruguay

- Signs of Dependency in 57% of consumers
- Three out of four CBP users are males
- Average age of first use: 20 years.
- History of inhalant abuse (60%)

8% in highly vulnerable, peripheral areas in Montevideo
Source: Uruguayan Observatory on Drugs. National Secretariat on Drugs

SECOND CENSUS OF MONTEVIDEO AND FIRST NATIONAL CENSUS OF TREATMENT CENTERS AND USERS IN TREATMENT

• In October 2010 25 centers in Montevideo and 9 Centers in the countries’ interior were studied

<table>
<thead>
<tr>
<th>TOTAL COUNTRY</th>
<th>No.</th>
<th>%</th>
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<tbody>
<tr>
<td>Public</td>
<td>805</td>
<td>63.1</td>
</tr>
<tr>
<td>Private or NGO</td>
<td>337</td>
<td>26.4</td>
</tr>
<tr>
<td>Private with state sponsored financial support</td>
<td>186</td>
<td>8.3</td>
</tr>
<tr>
<td>Private with community support and international financing</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>1275</td>
<td>100.0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug of greatest impact</th>
<th>Public</th>
<th>Private or NGO</th>
<th>Private w/ state sponsored financial support</th>
<th>Private w/ community support and international financing</th>
<th>Total Montevideo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>6.8</td>
<td>17.7</td>
<td>9.2</td>
<td>11.8</td>
<td>10</td>
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<tr>
<td>Marijuana</td>
<td>5.1</td>
<td>14.5</td>
<td>1.3</td>
<td>17.6</td>
<td>7.5</td>
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<tr>
<td>CBP</td>
<td>73.2</td>
<td>30.1</td>
<td>67.1</td>
<td>64.7</td>
<td>61</td>
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<tr>
<td>Cocaine Hcl</td>
<td>13.6</td>
<td>32.1</td>
<td>15.8</td>
<td>5.9</td>
<td>18.6</td>
</tr>
<tr>
<td>others</td>
<td>1.5</td>
<td>5.6</td>
<td>6.6</td>
<td>0</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: OUD (SND)
Profile of CBP users

- Study carried out in the Information and reference center of the National Drug Network, "Yellow Doorway" (UOD, 2006)

  - Majority male
  - Average age 23 years, 37% minors
  - 90% under 30 years of age
  - Majority unmarried, unemployed
  - Vast majority began high school (high school, technical school), but did not complete it
  - Less than 20% have stable work or studies
  - High % used to live with parents (less than 13% living with own family)
  - Half had received previous treatment with UPD
  - 2/3 symptoms of a psychiatric condition
  - 18.9% violent behavior
  - 58% legal problems


Does a single profile exist?

<table>
<thead>
<tr>
<th>Table 13. Distribución de Nº Personas según Sustancia Principal de Consumo al Ingreso por Sexo</th>
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<tbody>
<tr>
<td>Sustancia</td>
</tr>
<tr>
<td>Pasta Base</td>
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<tr>
<td>Alcohol</td>
</tr>
<tr>
<td>Mariguana</td>
</tr>
<tr>
<td>Saludantes</td>
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<tr>
<td>Inhambients</td>
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<tr>
<td>Crack</td>
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<tr>
<td>Heroina</td>
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<tr>
<td>Otros Opioides</td>
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<tr>
<td>Anfetaminas</td>
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<tr>
<td>Otros Estimulantes</td>
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<tr>
<td>Alucinogenos</td>
</tr>
<tr>
<td>Otros</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
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<table>
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<th>Table 14. Distribución de Nº Personas según Sustancia Principal de Consumo al Ingreso por Sexo</th>
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<tbody>
<tr>
<td>Sustancia</td>
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<td>Alcohol</td>
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<td>Mariguana</td>
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<td>Saludantes</td>
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<td>Inhalantes</td>
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<td>Heroina</td>
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<td>Otros Opioides</td>
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<td>Anfetaminas</td>
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<td>Otros Estimulantes</td>
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<tr>
<td>Alucinogenos</td>
</tr>
<tr>
<td>Otros</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

CBP: higher demand for treatment (Chile, 2010)

Treatment and Rehabilitation Section, CONACE. Technical Report 2010. Santiago, Chile.
**COCAINE BASE PASTE**

- Intermediate product in the production of cocaine
- White/brown powder, pungent odor
- Variable percentage of cocaine (40-85 %). (Castaño G, 2000)
- Alkaline, liposoluble
- Volitization and high temp. → Smoked
- Dose (chasqui, medio): 0.1 – 0.5 g
  “Tiza” (pack): 10 g

**COCAINE BASE PASTE – Composition**

- **Toffoli et al. 1965**
  - First analytic studies on cocaine base paste
  - Cocaine, ecgonine, anhydroecgonine
  - Variability (up to 70% cocaine)

- **Elsohly, 1991**
  - Samples of CBP from Colombia and Peru
  - Cocaine > 60 %
  - Contaminants (aromatic hydrocarbons, waste gas, manganese and potassium permanganate in Colombian samples)
  - Other coca leaf alkaloids (tropacocaine, cinnamoylcocaine cis-, trans-cinnamoylcocaine).
COCAINE BASE PASTE - Composition

- Elsohly, 1991

  - **Differences** in samples from Colombia and Peru

- Meickle et al. 2009

  - First preclinical study on CBP (Uruguay)
  - Cocaine (68 %)
  - Caffeine as adulterant (15 %)
  - Ecgonine, cis-cinnamoylcocaine, trans-cinnamoylcocaine
  - Impurities (0.1 a 9 %)
  - Absence of solvents

SMOKEABLE COCAINE in BRAZIL (Bastos et al. Addiction 2011)

- **Crack Rocks**, derived from del hydrochloride with bicarbonate and sodium added

- **Cocaine paste (CBP)** smoked as free base

- “Merla”, base paste containing a high proportion of solvents and industrial products such as battery acid.

- “Oxi”, produced from residues or waste from coca paste, prepared with gasoline, kerosene and lime (calcium oxide).
CBP - Composition (Uruguay)

• Different from Crack (Europe, USA)

• Differences between samples of CBP analyzed in Colombia and Peru

• Similarities and differences between CBP in Uruguay, Argentina and crack presently consumed in Brazil

COCAINE BASE PASTE - Composition

"... complex product from the chemical point of view, should not be assumed to have the same biological and toxicological properties as cocaine even though it is the largest alkaloid component..." - Elsohly, 1991
COCAINE BASE PASTE  Adulterants

• Cuts: talcum powder, sugar, mannitol, dipyrone, crushed glass tube light ...

• Simile-cocaine:
  - Lidocaine
  - Caffeine
  - Horse Stimulant

CLENBUTEROL

Fuente: El Observador, 2011

COCAINE BASE PASTE  Toxicity

- Cocaine
- Other Alkaloids?
- Impurities
- Adulterants
- Combustion Products
- Heat Injuries
**COCAINE BASE PASTE - Mode of consumption**

- Cocaine smoked in metal cans, hand-made pipes (metal and plastic), car antennae
  - + Aluminum paper
  - + Cigarette ashes
- Associated with marijuana (basoco) or tobacco (tabasoco)
- **Poly-use** (ethanol, marijuana, cocaine Hcl)

**COCAINE BASE PASTE - Addictive Potential**

Very intense High

Crash and dysphoria

Rapid development of withdrawal symptoms (dependency)

Mode of Consumption (Meickle et al 2009)

COMPOSITION ? (Lopez Hill et al 2011)
“Our first observations indicated [a minimum of] euphoria and pleasure experiences during intoxication; Indeed the patient said ‘[I] do not understand why [I] consumed coca paste’ .... During the intoxication period [the user] experienced anxiety but above all an indescribable compulsion to continue using. We also observed an increasingly intense decompensation of nutritional and personal care habits; .... All this led us to the conclusion that we were facing a new, interesting and serious psychopathological disorder.”

Dr. Navarro Cueva
Hospital Hermilio Valdizán, Lima, Perú
(1972)

**CBP: Experience CIAT, Montevideo, Uruguay.**

- Period January 1, 2004 – December 31, 2005
- 113 admissions for CBP use in 48 hours
- IAE few hours after last use (ingestion of meds: Psycho-pharmaceuticals, cardiovascular, endocrine)


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**COCAINE BASE PASTE: Experience CIAT**

- Similar clinical manifestations in overdose as crack and cocaine HCl.
- Smokeable cocaine (euphoria, respiratory symptoms)
- Suicide attempts: dysphoria consumption post
- Poly-drug use: diagnostic difficulties and multiplication of risks (62 % abuse - 38 % suicide attempts)

**COCAINE BASE PASTE Chronic complications**

- Intense psychological and physical dependency
- Neuropsychiatric - disturbances SPECT (Ferrando et al. 2009). Need to establish differences with psychiatric co morbidities (Cardeillac et al, 2009)

- Complications: cardiovascular system, central nervous system, liver.

- Malnutrition

- Mode of consumption: respiratory disease, burns
- Transmittable infectious diseases
  - High risk sexual behavior
  - Consumer devices?

**COCAINE BASE PASTE - Respiratory Disease**

- Respiratory symptoms in PBC users are very frequent and seem to be related to specific lung disease.

- Rx findings consistent with chronic bronchitis, pneumonia associated with eosinophilia in three cases (lung similarity to crack?)

- CT abnormalities: chronic respiratory irritation cocaine and combustion products

- Similarities with studies in crack users, both in the context of poly-drug use and case reports.

COCAINE BASE PASTE AND PREGNANCY

- Maternity Complications:
  - overdose – acute intoxication
  - Obstetrics : spontaneous abortion, DPPNI, hypertensive state in pregnancy
  - Acute psychiatric conditions
  - Withdrawal Syndrome
  - Infectious diseases
  - Chronic parenchyma repercussions

Pascale A, UNDP 2010.

• Magri et al. 2007
  - Survey among mothers at Montevideo Pediatric Hospital (n=900):
    * 0.4 % PBC y 0 % CI cocaine
  - Meconium samples (n=204) : 2.5 % (CI cocaine and CBP)

• Moraes et al. 2011
  - Survey (n=239): 0.43 % (PBC) and 0.87 % (cocaine Hcl)
  - Samples in Meconium (n=93): 9.37 % (cocaine Cl and CBP)

COCAINE BASE PASTE and PREGNANCY

- Congenital Malformations?
- Increase FC and PA
- RCIU, low birth weight, premature birth, small for gestational age (Mena et al 2000)
- Withdrawal syndrome (mild)
- Vertically transmittable diseases
- Lactation: risk of overdose
- Neurodevelopment disorders

### COCAINE BASE PASTE - Treatment

- **Integral Treatment** — interdisciplinary approach
- **Individual Evaluation**
  - Medical (psychiatric, toxicological)
  - Psychological (including relapse prevention)
  - Socio-familiar diagnosis
- **follow-up**
- **Treatment**
  - Individual/group (relapse prevention)
  - Specific approaches (adolescents, women, imprisoned)
  - Ambulatory/residential
  - Abstinence
  - Harm reduction

### Consensus for the integral treatment of neonates exposed to psychoactive substances during gestation

- **Moraes et al. Arch Pediatr Urug 2010; 81(4): 251-257**
- Approved by consensus by the National Health Program for Children (Ministerio de Salud Pública - Uruguay), abril 2011.
- Interdisciplinary team (neonatologist pediatricians, child and adult psychiatrists, toxicologists, social workers, neuro-pediatricians).
- Prenatal assessment
- Possible clinical and behavioral scenarios to follow up given mother consumed cocaine base paste during pregnancy.
- Variables: abstinence during the last trimester, birth control, desire to stop use, neonatal physical exam, maternal risk factors (craving, withdrawal syndrome), social network and family support risks, bonding between newborn and mother.
- Includes: decision re: rooming together, lactation, type of follow up (during admission and discharge), according to above variables.
CHALLENGES: proposed by REDLA

- Deepen research regarding the composition in different countries (and within different zones across countries...)
- Continue research on acute clinical symptoms related to CBP consumption, characterizing the associated pathology (ies).
- More in-depth studies on pulmonary repercussions with greater numbers of patients, long term prospective studies with control group and tobacco smokers, marijuana and CBP as both exclusive use and poly-drug use.
- Continue research on cardiovascular impact (SPECT)
- In-depth studies on the repercussions associated with mode of use (exposure biomarkers)
- Continue the evaluation and study of neuropsychological repercussions (case studies), liver, kidney (clinical cases of rhabdomyolysis and acute kidney failure).
- Research on embryo-fetal repercussions and effects on neurodevelopment.
- Design studies to evaluate the efficacy of pharmacological and costs to treatment.

Dr. Antonio Pascale Prieto
MD, Toxicologist

Red Latinoamericana de Investigadores en Droga (REDLA)

dr_antoniopascale@yahoo.com
antopascale@gmail.com