Forensic Neuropsychiatry Committee Workshop

Neurotoxin Exposure in Forensic Assessment

“Look what my meds made me do…”
A Case of Alleged Mefloquine-Induced Criminal Behavior

Hal S. Wortzel, MD
Director, Neuropsychiatric Consultation Services and Psychiatric Fellowship
VISN 19 MIRECC, Denver Veterans Hospital
Faculty, Program in Forensic Psychiatry and Neurobehavioral Disorders Program
University of Colorado, Department of Psychiatry
The Case...

- 23 y/o male facing charges of:
  - Sex Asst-Overcome Will-Aid/SBI/Weapon   F2
  - Kidnapping 2-Victim Sex Assault/Robbery   F2
  - Violent Crime-Used Weapon   SE

- Waved down victim, asked for a ride, and produced a knife

- “Don’t make me cut you. I’m not a bad person. I’m not going to hurt you, but somebody is in trouble.”
The Case...

• Grabbed victim and led her to an apartment
• Removed the victim’s pants, “played with himself for a while,” put on condom and proceeded with vaginal intercourse, attempted anal intercourse but unable to complete, resumed vaginal intercourse ejaculated onto victim’s T-shirt.
• At one point defendant stated he was going shower, changed his mind stating, “No, if I shower you’ll leave.”
The Case...

- Long and complicated pre-trial course involving initial claims of NGRI
- But eventually abandoned insanity defense and advanced a different affirmative defense strategy at trial...
- The Mefloquine he was required to take while serving in Iraq, nearly 6 months prior to the incident, caused the behavior at issue
Involuntary Intoxication:
Colorado Revised Statutes 18-1-804

• A person is not criminally responsible for his conduct if, by reason of intoxication that is not self-induced at the time he acts, he lacks capacity to conform his conduct to the requirements of the law.

• "Intoxication", as used in this section means a disturbance of mental or physical capacities resulting from the introduction of any substance into the body.
The Defense...

- Defense retained three separate experts in support of this theory, two physicians, including one forensic psychiatrist.

- Defense experts produced lengthy and heavily referenced reports, seemingly supporting that Mefloquine can result in severe neuropsychiatric side effects, including the behaviors in question.

- Contesting such claims mandates the ability to precisely interpret and communicate actual meaning of relevant literature.
Manipulating the data...

- Epidemiology: 41.6% of patients suffer moderate to severe neuropsychiatric side effects
- Case reports: A number of case reports involving assaults/murders following mefloquine exposure
- Basic Science: mefloquine blocks Cx36 and Cx50 gap junctions in neurons
Schlagenhauf (2003)

Incidence of adverse events in antimalarial prophylaxis arms according to severity.

<table>
<thead>
<tr>
<th>Severity of Adverse Event</th>
<th>Mefloquine Group (n=153)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>135 (88, 83-93)</td>
</tr>
<tr>
<td>Moderate</td>
<td>64 (42, 34-50)</td>
</tr>
<tr>
<td>Severe</td>
<td>6 (11, 6-15)</td>
</tr>
</tbody>
</table>

Mild = Trivial but some discomfort noted

Moderate = Interferes with Daily Activity

Severe = Medical advice required

Proportion of participants in each antimalarial prophylaxis arm reporting adverse events, by type and severity

<table>
<thead>
<tr>
<th>Neuropsychological</th>
<th>Mefloquine Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>8 (5, 2-9)</td>
</tr>
<tr>
<td>Moderate</td>
<td>56 (37, 29-44)</td>
</tr>
<tr>
<td>All Events</td>
<td>118 (77, 70-84)</td>
</tr>
</tbody>
</table>

*Symptoms include headache, strange or vivid dreams, dizziness, anxiety, depression, sleeplessness, and visual disturbance.
“Spectacular Suicide”

- Various case reports offered, only one from the medical literature
- *Spectacular Suicide associated with mefloquine*, published in French, 2005
- Case report of single suicide associated with mefloquine
- “27 year-old man was discovered at his home, covered with multiple knife wounds… suicide during acute psychosis associated with mefloquine was suggested.”

Presse Med. 2006 May; 35:789-92
“Potent block of Cx36 and Cx50 gap junctions by mefloquine”

- Patch pipettes measuring excitatory postsynaptic potentials from rat brain slices in Petri dishes
- “Side effects of mefloquine administration, such as anxiety, confusion, dizziness, dysphoria, and severe neuropsychiatric effects might be due to gap junction blockade”
Predatory Sexual Violence?
Lessons?

• There’s an “expert” for almost everything
• There’s a literature for almost everything in this day of electronic publication
• Can’t rely on rules of evidence to exclude even the most egregious misapplications of science
• Effective forensic neuropsychiatric witnessing requires the ability and willingness to develop needed expertise in unexpected topics and make sense of the spectrum of literature and/or opinions out there
Acknowledgements...

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