Management of Acute Agitation in the Emergency Department

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National Mental Health Strategy

• In the early 1990’s, a national collaboration of Federal and State Governments acknowledged the priority for community based management of mental health

• Subsequently, mental illness has been deinstitutionalised and in-patient beds redistributed to general hospitals

• This is not a cheap option and community funding is struggling to keep up with demand
National Mental Health Strategy

- The ED, at the interface of community and acute health, is increasingly required to manage the acute and chronic mentally ill patient.
MH Demographics to ED

- 52% male
- Median age 32 (IQR 24 – 43)
  - Under 16 – 2.1%
  - Over 65 - 4.3%
- Presentation
  - Ambulance - 40%
  - Police – 18%
- Past or present MH client – 77%
Time of arrival

00:00-04:00
04:00-08:00
08:00-12:00
12:00-16:00
16:00-20:00
20:00-24:00
Concurrent Intoxication

- One third of mental health patients are intoxicated
- Half the intoxication is alcohol related
- Drugs are typical for self-harm and abuse

<table>
<thead>
<tr>
<th>Toxicology</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>580</td>
<td>15.7</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>261</td>
<td>7.0</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>81</td>
<td>2.2</td>
</tr>
<tr>
<td>Marijuana</td>
<td>70</td>
<td>1.9</td>
</tr>
<tr>
<td>Narcotics</td>
<td>65</td>
<td>1.8</td>
</tr>
<tr>
<td>Ecstasy</td>
<td>22</td>
<td>0.6</td>
</tr>
<tr>
<td>Chroming</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>GHB</td>
<td>5</td>
<td>0.1</td>
</tr>
<tr>
<td>Cocaine</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>Other</td>
<td>314</td>
<td>8.5</td>
</tr>
<tr>
<td>None</td>
<td>2484</td>
<td>67.0</td>
</tr>
</tbody>
</table>
THE ED ENVIRONMENT

• Always operational
  – noisy
  – lights on
  – sleep deprivation
• No opportunity for seclusion
• No privacy
• Nowhere to smoke
• No set routines
Restraint is employed in 0.3 to 1.5% of Australasian ED presentations

Cannon et al ANZ J Psych 01
Knott et al EMA 04

Time from triage to being seen by a doctor
Median 8 minutes
IQR 2–21 minutes
90% seen < 1 hour

Time from triage until Code Grey called
Median 59 minutes
Chemical Restraint

• In ED’s with a FACEM Director

  – Indications for restraint
    • Violence 52%
    • Mental illness 32%
    • Acute brain syndrome 10%
    • Intoxication 4%

  – 100% used chemical restraint
    • Haloperidol 93%
    • Midazolam 82%
    • Diazepam 59%

Cannon et al ANZ J Psych 01
ED Restraint in 5 Melbourne EDs over 5 months, 2004

- Code Grey called on 8% of MH presentations
- Physical restraint required for 4%
  - Median time 3 hours
  - Maximum time 39 hours
- Chemical restraint required for 11%
  - Diazepam 42%
  - Midazolam 36%
  - Droperidol 25%
  - Olanzapine 11%
Chemical Restraint

Benzodiazepines versus Neuroleptics
Midazolam vs Diazepam
Droperidol vs Haloperidol
Atypical Neuroleptics

Minimal research into best practice for EDs

Different patient populations and outcomes compared to inpatient studies
RMH study

RMH RCT of droperidol versus midazolam for rapid tranquillisation of acutely agitated patients

Consent not required

5mg of drug was given every 5 minutes until sedation or a total of 20 mg

Annals of Emerg Med
2006:47(1);61-7
## Results

<table>
<thead>
<tr>
<th></th>
<th>Droperidol</th>
<th>Midazolam</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug</td>
<td>79</td>
<td>74</td>
<td>0.75</td>
</tr>
<tr>
<td>Age (sd)</td>
<td>33 (12)</td>
<td>36 (14)</td>
<td>0.09</td>
</tr>
<tr>
<td>Male</td>
<td>65%</td>
<td>64%</td>
<td>0.89</td>
</tr>
<tr>
<td>Dose: i (+)</td>
<td>5 (5)</td>
<td>5 (0)</td>
<td>0.48</td>
</tr>
<tr>
<td>Other drug</td>
<td>16 (20%)</td>
<td>9 (12%)</td>
<td>0.18</td>
</tr>
<tr>
<td>Midazolam</td>
<td>10</td>
<td>3</td>
<td>0.06</td>
</tr>
<tr>
<td>Droperidol</td>
<td>6</td>
<td>6</td>
<td>0.91</td>
</tr>
<tr>
<td>Intoxication</td>
<td>33 (42%)</td>
<td>28 (38%)</td>
<td>0.57</td>
</tr>
<tr>
<td>Drug</td>
<td>10</td>
<td>7</td>
<td>0.53</td>
</tr>
<tr>
<td>Alcohol</td>
<td>26</td>
<td>26</td>
<td>0.77</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>53 (67%)</td>
<td>47 (64%)</td>
<td>0.57</td>
</tr>
<tr>
<td>Missing</td>
<td>7</td>
<td>10</td>
<td>0.41</td>
</tr>
</tbody>
</table>
Time to Sedation

Kaplan-Meier survival estimates, by drug

HR=0.86
(95%CI: 0.61, 1.23, p=0.42)
Time to Sedation

Median time to sedation (min)

- Droperidol: 8 (5-15) min
- Midazolam: 6.5 (2-15) min, p=0.07

Sedated by 5 minutes

- Droperidol: 13/79 (16%)
- Midazolam: 33/74 (42%), p<0.001

Sedated by 10 minutes

- Droperidol: 42/79 (53%)
- Midazolam: 41/74 (55%), p=0.78
<table>
<thead>
<tr>
<th><strong>Droperidol</strong></th>
<th><strong>Midazolam</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dystonic reaction</td>
<td>Airway Mx.</td>
</tr>
<tr>
<td>Dystonic reaction</td>
<td>Airway Mx.</td>
</tr>
<tr>
<td>Dystonic reaction</td>
<td>Airway Mx.</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Hypoxia</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Hypoxia</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Hypoxia</td>
</tr>
<tr>
<td>Bradycardia</td>
<td>Hypoxia</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Hypotension</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Hypotension</td>
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</tr>
</tbody>
</table>

p = 0.37
Comparison with earlier studies

The TREC group (Rio) found midazolam more effective than haloperidol/promethazine with similar adverse events. 

Richards et al found droperidol to be faster and more durable than lorazepam.
Newer Agents

- Olanzapine IM or wafer for acutely disturbed/agitated people with suspected serious mental illnesses
  
  RB Belgamwar and M Fenton - Cochrane Database of Systematic Reviews 2006 Issue 4

- No better than lorazepam
- No faster than haloperidol, less akathisia
Patient Preferences

Structured interview
Knowledge and necessity of restraint
VAS for 5 emotional axis
  - Anger
  - Happiness
  - Anxiety
  - Gratitude
  - Fear
Preference for future restraint
Results

44 patients
75% male
Mean age 33 (17-69)

Intoxication
9 (21%)
  6 Alcohol
  5 Drugs

Psychiatric
34 (79%)
  5 Alcohol
  5 Drugs

Organic
1 with DKA
Restraint details

- Manual 33 (75%)
- Physical 35 (80%)
  300min (20 – 950)
- Chemical 40 (91%)
  - 28 droperidol (12mg)
  - 23 midazolam (7 mg)
Results

• Aware of restraint 31 (70%)
  • Mental illness (77%)
  • Intoxication (61%)
  • Not associated with sedation

• Reason for restraint 18 (41%)

• Restraint necessary 11 (31%)
  • Mental illness (22%)
  • Intoxicated (50%)

• Reported Injury 11 (25%)
Results

- Median scores: 5
- Range: 0-10
## Results

<table>
<thead>
<tr>
<th></th>
<th>0 Most positive</th>
<th>5</th>
<th>10 Most negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
<td>37</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>Happiness</td>
<td>12</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Gratitude</td>
<td>19</td>
<td>35</td>
<td>23</td>
</tr>
<tr>
<td>Anxiety</td>
<td>30</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Fear</td>
<td>28</td>
<td>19</td>
<td>26</td>
</tr>
</tbody>
</table>
Results

• Intoxicated patients
  – Happier to be restrained
  – More grateful
  – No difference in anger, anxiety or fear scores

• Choice of chemical restraint made no difference to impact of restraint
## Future restraint

<table>
<thead>
<tr>
<th></th>
<th>Restraint for others</th>
<th>Restraint for myself</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedation</td>
<td>46%</td>
<td>52%</td>
</tr>
<tr>
<td>Physical</td>
<td>25%</td>
<td>23%</td>
</tr>
<tr>
<td>Manual</td>
<td>18%</td>
<td>23%</td>
</tr>
<tr>
<td>None</td>
<td>9%</td>
<td>14%</td>
</tr>
<tr>
<td>Unsure</td>
<td>23%</td>
<td>16%</td>
</tr>
</tbody>
</table>

Divergence 32%
Discussion

- Restraint clearly has a significant and negative impact on a large proportion of our patients.

- Mentally ill patients are more likely to be aware they have been restrained and less likely to believe it was necessary.
Conclusion

• Highly agitated patients are a real issue for EDs
• There is no agent that is completely safe and effective
• There are pros and cons for the use of benzodiazepines and neuroleptics
• There is a paucity of research on this topic
Thank-you
$\text{QT}_c$ interval

Droperidol $52$ 439 (352 – 516)
Midazolam $56$ 425 (382 – 507)

\[ p = 0.002 \]
Droperidol

- Black Box due to 271 adverse events, world-wide, including 93 deaths
- 80 deaths with doses >10mg (50 to 100)
- 71 cases including 55 deaths were reported from the same source on July 9, 2001
Droperidol

- 13 deaths with dose <10 mg
  - 5mg plus 450 clozapine
  - Droperidol + dopamine, dobutamine, adrenaline
  - 3 anaesthetic deaths, none with long QT, 1 patient had received 0.625mg, another 0.25 orally
  - 79 yo with perforated appendix

- ACEP and American Society Anaesthesiology have expressed concerns over warning