Why do some patients withdrawing from alcohol take longer to recover?

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Addiction Nurses Symposium
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Te Papa Porirua
Why the interest

• Dieticians
• Diets for alcohol withdrawal patients
• Significantly long recovery time
• Poor recognition/understanding
• Few studies
• No internationally evidence based guidelines
• Josephus Flavius
  – Jews captured and starved in Roman war

• Japanese POW’s

• Concentration camp victims
Who is at risk

- Patients with
  - Anorexia nervosa
  - Chronic alcoholism
  - Oncology\post operative\elderly
  - Uncontrolled diabetes
  - Morbid obesity with profound weight loss
  - Malabsorptive syndrome
    - Inflammatory bowel disease
    - Chronic pancreatitis
- Long-term users antacids (magnesium and aluminium salts bind phosphate)
- Long-term users of diuretics (loss of electrolytes)
Metabolically what happens

Starvation/Malnutrition → Weight loss (10% body wgt over 2months) 5+ days without nutrition → ↓ insulin ↑ glucagon

↓ insulin ↑ glucagon → Gluconeogenesis

protein catabolism, electrolyte and vit. depletion – salt and water intolerance → Gluconeogenesis

Refeeding → Fluid salt, nutrients CHO major energy source.

↑. Glucose uptake

↑. Utilisation of thiamine

↑ uptake K⁺ Mg²⁺ PO₄²⁻ → Hypophosphatemia

Hypomagnesaemia, Hypokalemia

↓ in electrolytes + fluid retention → Clinical features of refeeding syndrome


Thiamine deficiency Salt and water retention Odema → Clinical features of refeeding syndrome
Clinical manifestations of mineral depletion in refeeding syndrome

<table>
<thead>
<tr>
<th>Mineral/vitamin</th>
<th>Risk level / replacement</th>
<th>Range</th>
<th>Clinical features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium</td>
<td>&lt;0.55mmol/L</td>
<td>0.70 -1.10 mmol/L</td>
<td>Cardiac irritability, worsening cardiac arrhythmias, neuromuscular complications, insomnia, hyperactive reflexes, muscle cramps, tetany, seizures</td>
</tr>
<tr>
<td>Phosphate</td>
<td>&lt;0.44 mmol/L</td>
<td>0.8 - 1.50 mmol/L</td>
<td>Weakness, respiratory distress, rhabdomyolysis, heart failure, parasthesias, confusion, seizures, thrombocytopenia, leukocyte dysfunction</td>
</tr>
<tr>
<td>Potassium</td>
<td>&lt;3.0 mmol/L</td>
<td>3.5 - 5.2 mmol/L</td>
<td>Alternation in electrochemical membrane potential, weakness, arrhythmias, cardiac arrest</td>
</tr>
<tr>
<td>Thiamine</td>
<td>&gt;140 nmol/L</td>
<td>&lt;140 nmmol/L</td>
<td>Lactic acidosis, Wernicke encephalopathy (ocular abnormalities, ataxia confusional state, hypothermia, coma)</td>
</tr>
</tbody>
</table>
In total, 52 alcohol dependent patients were admitted for alcohol withdrawal between April and August 2012.

10 excluded (Admitted from ED)

6 excluded Day 1 bloods not obtained

1 readmission

36 included
Method

• Assessment
  – Standard history and examination
  – Weight: Height; + BMI
  – Nutritional history
  – Day 1 and Day 3 Bloods
    • Phosphate
    • Magnesium
    • LFT’s
## Patient demographics

<table>
<thead>
<tr>
<th>Number</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age at admission (years)</td>
<td>48.4</td>
</tr>
<tr>
<td>Standard drinks (units per week)</td>
<td>27.4</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male (%)</td>
<td>16 (44.4)</td>
</tr>
<tr>
<td>Female (%)</td>
<td>20 (55.6)</td>
</tr>
<tr>
<td>Taking multivitamins (%)</td>
<td>16 (44.4)</td>
</tr>
<tr>
<td>Loose bowel motions (%)</td>
<td>6 (16.6)</td>
</tr>
<tr>
<td>Chronic pancreatitis (%)</td>
<td>1 (2.8)</td>
</tr>
<tr>
<td>On diuretic medications (%)</td>
<td>1 (2.8)</td>
</tr>
<tr>
<td>On antipsychotic medication (%)</td>
<td>5 (13.9)</td>
</tr>
<tr>
<td>On antidepressant medication (%)</td>
<td>18 (50)</td>
</tr>
<tr>
<td>Previous gastric bypass (%)</td>
<td>3 (8.3)</td>
</tr>
</tbody>
</table>
BLOOD chemistry

Day 1-3

• No statistical difference in mean serum levels of:
  – Potassium
  – Phosphate
  – Magnesium

• Statistically significant difference of mean adjusted calcium; 2.34 mmol/L TO 2.4 mmol/L
Blood Chemistry

DAY 1 (36 patients)

• 3 serum low potassium 3.3 - 3.1 (3.5 – 4.9 mmol/L)
• 5 low serum phosphate 0.56 lowest (0.95 – 1.60 mmol/L)
• 16 low serum magnesium 0.54 lowest (0.76 – 0.99 mmol/L)

DAY 3

• 0 serum potassium below reference range
• 2 low serum phosphate 0.79 lowest
• 20 low serum magnesium 0.58 lowest
Blood Chemistry

Thiamine levels
29/36 thiamine levels prior to supplementation
Ref range: 140nmol/L
Three patients low thiamine
Values 97  nmol/L
  110  nmol/L
  129  nmol/L
Magnesium

- Cofactor more than 300 enzyme-catalysed reaction
- Magnesium and alcohol
- Magnesium and thiamine
- Direct effect on sodium/potassium/calcium
- Cardiac muscle cell function
  - Arrhythmia's (SVT)
## Outcomes

- First prospective study screening for refeeding syndrome
- No patients admitted developed refeeding syndrome
- Thiamine
- Planned vs unplanned admissions
- Screening
- Definition of refeeding
Prevention

- Early recognition in high risk patients
- Screening for reduced food intake
- Identification/screening nutritional status
- Vitamin supplementation
- Consultation
Thank-you

- The individual patients who participated in this study
- Dr Geoffrey Robinson
- Dr Stephanie Manning
- Colleagues at CADS  CCDHB Wellington NZ
REFERENCES

Mehanna HM, Moledina J, Travis J. Refeeding Syndrome: What it is and how to present and treat it. BMJ 2008; 336:1495-8


