OPIOID ENDOCRINOPATHY

Demerast SP, Gill RS, et al.
Endocrine Practice. 2015;21:190-198
• Prescriptions increased from 9.3-22.9 million between 2002-2009
• Adverse effects include constipation, nausea, pruritus, sedation and headache
• Medicare opioid users have greater rates of falls, fractures and hospitalizations
Suppression of pulsatile GnRH leads to diminished LH/FSH secretion and reduced testosterone production (OPIAD)

- μ opioid receptors on spermatozoa/ morphine leads to reduced sperm motility
- 96% of men receiving intrathecal morphine had reduced libido
- 86% had reduced testosterone/ the effect is dose dependent
Hypothalamic-pituitary-gonadal axis

• 69% of women had reduced libido with intrathecal opioids
• 21 of 21 pre-menopausal women became amenorrheic on intrathecal opioids
• Buprenorphine is less potent in HPA axis suppression than methadone
• HPA recovery is to be expected following discontinuation of treatment
Hypothalamic-pituitary- adrenal axis

- Suppression of the hypothalamic- pituitary system leads to $2^0$ adrenal insufficiency
- Both basal and ACTH or hypoglycemia stimulated cortisol may be low
- DHEA-s may be suppressed
- Fentanyl may be a more potent suppressant than morphine
- ??clinically relevant/??replacement needed
Other effects

• Thyroid hormone status- no reliable evidence of meaningful impact
• Prolactin- uncertain
• Growth hormone- uncertain
• Vasopressin- uncertain
• Bone density may be reduced in opioid users but so many confounders makes direct effect on bone difficult to assess
**Table 2**

Acute and Chronic Effects of Opioids on the Endocrine System

<table>
<thead>
<tr>
<th>Endocrine system</th>
<th>Acute effects</th>
<th>Chronic effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gonadal</td>
<td>↓ GnRH, LH/FSH, testosterone</td>
<td>↓ GnRH, LH/FSH, testosterone</td>
</tr>
<tr>
<td>Adrenal</td>
<td>Unknown</td>
<td>↓ ACTH, cortisol</td>
</tr>
<tr>
<td>GH</td>
<td>↑ GH</td>
<td>↓ GH</td>
</tr>
<tr>
<td>Thyroid</td>
<td>↑ TSH</td>
<td>↓ TSH vs. no effect</td>
</tr>
<tr>
<td>PRL</td>
<td>Unknown</td>
<td>↑ PRL</td>
</tr>
<tr>
<td>AVP</td>
<td>↑ AVP</td>
<td>↓ AVP</td>
</tr>
<tr>
<td>Bone</td>
<td>Unknown</td>
<td>↓ Bone mineral density</td>
</tr>
</tbody>
</table>

Abbreviations: ACTH, adrenocorticotrophic hormone; AVP, arginine vasopressin; GH, growth hormone; GnRH, gonadotropin-releasing hormone; LH, luteinizing hormone; PRL, prolactin; TSH, thyroid-stimulating hormone.