Hypo/achlorhydria is Associated with False-Positive Secretin Stimulation Testing (SST) for Zollinger-Ellison Syndrome (ZES)

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Background

- The hallmark of Zollinger Ellison Syndrome (ZES) is inappropriate hypergastrinemia, manifest by elevated fasting serum gastrin levels in the presence of elevated levels of gastric acid production.
- With gastric analysis not routinely available, secretin stimulation testing (SST) is widely used instead.
- A positive SST is defined as a rise in serum gastrin concentration after intravenous secretin injection of >110 pg/ml (Deveney criteria) or >200 pg/ml (McGuigan criteria).
- However, case reports have documented false-positive SST in patients who are achlorhydric due either to atrophic gastritis or proton pump inhibitor (PPI) therapy.

Aims

- To review our experience with SST in hypo/achlorhydric patients undergoing evaluation for hypergastrinemia.

Methods

- We examined the charts of all patients who underwent gastric analysis and SST from Jan 1994 to Sept 2009.
- We identified patients with a basal acid output (BAO) < 5 mEq/hr, in the absence of prior gastric acid reducing surgery, to determine the frequency of false positive SST results.

Results

- Results 1: Demographics of patients

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (± SD)</td>
<td>47.9 years ± 13.4 years</td>
</tr>
<tr>
<td>Gender</td>
<td>19 female (70%)</td>
</tr>
<tr>
<td>Mean Basal Gastrin (± SD)</td>
<td>247.3 pg/ml ± 364.0 pg/ml</td>
</tr>
<tr>
<td>Mean BAO (± SD)</td>
<td>1.6 mEq/hr ± 1.8 mEq/hr</td>
</tr>
<tr>
<td>Anti-Secretory Therapy</td>
<td>20 patients (74%)</td>
</tr>
</tbody>
</table>

- Results 2: False positive SST in Patients with BAO < 5 mEq/hr

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Gender</th>
<th>BAO</th>
<th>Basal Gastrin</th>
<th>Delta</th>
<th>Criterion for SST evaluation</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31</td>
<td>Male</td>
<td>0.5 mEq/hr</td>
<td>1670 pg/ml</td>
<td>1300 pg/ml</td>
<td>&gt;200 pg/ml</td>
<td>Drug induced</td>
</tr>
<tr>
<td>2</td>
<td>37</td>
<td>Female</td>
<td>0 mEq/hr</td>
<td>191 pg/ml</td>
<td>213 pg/ml</td>
<td>&gt;200 pg/ml</td>
<td>Atrophy</td>
</tr>
<tr>
<td>3</td>
<td>51</td>
<td>Female</td>
<td>0 mEq/hr</td>
<td>1025 pg/ml</td>
<td>170 pg/ml</td>
<td>&gt;110 pg/ml</td>
<td>Atrophy</td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>Female</td>
<td>0 mEq/hr</td>
<td>1048.5 pg/ml</td>
<td>130.5 pg/ml</td>
<td>&gt;110 pg/ml</td>
<td>Atrophy</td>
</tr>
</tbody>
</table>

- Methods 1: Identification of patients

330 patients underwent gastric analysis
40 patients with BAO < 5 mEq/hr
13 patients with incomplete data
27 patients included in analysis

Results

- We identified 2 patients with false-positive SST using a cutoff of >200 pg/mL; one patient had gastric atrophy (BAO 0 mEq/hr) and one had drug-induced hypochlorhydria (acid output 0.5 mEq/hr on rabeprazole 20 mg PO BID).
- Using a cutoff >110 pg/mL we identified two additional false-positive test results, both with atrophy (BAO 0 mEq/hr for both).
- The false-positive test results were confirmed in all instances on additional follow up including structural and functional imaging.

Summary

- We identified 4/27 false positive secretin stimulation tests (14.8%) in patients who were hypo/achlorhydric.

Conclusion

- Positive SST should be interpreted carefully and in context in individuals in whom gastric acid secretion is suppressed, depressed, or unknown.

References

- Gastrontrillogics. 1980 Dec;70(s):112-6.
- Berno, MD et al. Medicine 2006;85:331-364.