



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.

Figure 1: Gastrin rise normally attenuated by inhibition from D cell.

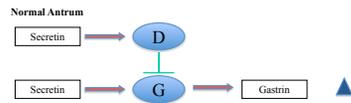


Figure 2: Paradoxical rise in gastrin in patients with ZES.

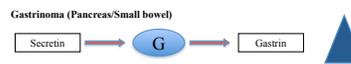
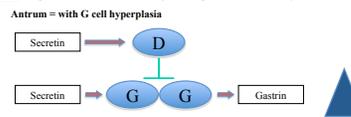


Figure 3: Proposed mechanism for rise in gastrin in patients with achlorhydria.



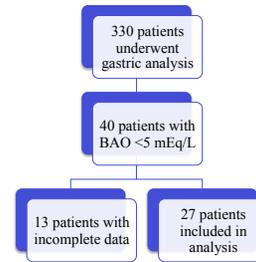
Aims

- 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.

- Methods 1:** Identification of patients



Results

- Results 1:** Demographics of patients

Demographics			Range
Mean Age (± SD)	47.9 years	± 15.4 years	17 – 72 years
Gender	19 female (70%)	8 male (29.6%)	
Mean Basal Gastrin (± SD) *	247.3 pg/ml	± 304.0 pg/ml	29 – 1670 pg/ml
Mean BAO (± SD)	1.6 mEq/hr	± 1.8 mEq/hr	0 – 4.9 mEq/hr
Anti-Secretory Therapy	20 patients (74%)	7 patients (26%)	
	Off anti-secretory therapy	On anti-secretory therapy	

*Basal Gastrin drawn during SST.

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

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

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

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