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Hypo/achlorhydria is associated with false-positive secretin stimulation testing (SST) for Zollinger-Ellison syndrome (ZES)

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Background: The hallmark of ZES is inappropriate hypergastrinemia, manifest by elevated fasting serum gastrin levels in the presence of elevated levels of gastric acid production. However, since gastric analysis is not routinely available, SST is widely used instead. SST is considered positive when a diagnostic rise in serum gastrin concentration after intravenous secretin injection occurs (>110 pg/ml or >200 pg/ml). However, case reports have documented false-positive SST in patients who are achlorhydric due either to atrophic gastritis or therapy with proton pump inhibitors (PPIs).

Aim: To review our experience with SST in hypo/achlorhydric patients.

Methods: We examined the charts of all patients who underwent gastric analysis and SST from Jan 1994 to Sept 2009 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: Of 330 patients who underwent gastric analysis during the testing period, we identified 40 that potentially fit the above criteria. Thirteen patients were excluded because they had incomplete data. Of the 27 patients with complete information available, the mean age was 47.9 years $\pm$ 15.4 years, 19 were female and 8 were male; the mean basal fasting gastrin level was 247.3 $\pm$ 304.0 pg/ml and the mean BAO value was 1.6 $\pm$ 1.8 mEq/hr. Twenty patients were studied in the absence of all anti-secretory therapy and 7 were studied on therapy. We identified 2 patients with false-positive SST using a cutoff of >200 pg/mL for a positive result; one with gastric atrophy (BAO 0 mEq/hr) and one

with drug-induced hypochlorhydria (acid output 0.5 mEq/hr on rabeprazole 20 mg 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. In addition, we found 3 true positive SSTs in patients with previously diagnosed ZES on medication therapy (acid outputs of 0.4, 1.2 and 1.3 mEq/hr on lansoprazole 60 mg BID, esomeprazole 40 mg BID and omprazole 20 mg BID, respectively).

Conclusions: We identified 4/27 false positive secretin tests (14.8%) in patients who were hypo/achlorhydric. Positive SST should be interpreted carefully and in context in individuals in whom gastric acid secretion is suppressed, depressed or unknown.