

ADVANCES IN GERD

Current Developments in the Management of Acid-Related GI Disorders

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Management of the Acid Pocket



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G&H What causes a pocket of acid to form in the stomach of a patient?

PK The acid pocket is a normal physiologic phenomenon that occurs in all people—not, as sometimes thought, just in people with gastroesophageal reflux disease (GERD). Essentially, the food that a person eats neutralizes gastric acid, but soon afterward—within 15 minutes—the stomach secretes acid in response to that food. This newly secreted acid layers on top of the meal; it does not mix with the meal, resulting in a region on top of the food—the acid pocket—that is highly acidic.

G&H Are there any factors that determine the location and size of this acid pocket?

PK The location is mainly determined by posture because the acid pocket goes to the top of the stomach, regardless of a person's posture; for example, when a person is in an upright position, the acid pocket is near the gastroesophageal junction because that is on top.

In terms of the acid pocket's size, there has not been much research on this issue, but one would predict that larger meals—which tend to result in more acid secretion—would be associated with a larger acid pocket. Likewise, in general, anything that augments acid secretion, regardless of the reason, would produce a larger acid pocket. This is important to keep in mind because the acid pocket is thought to be a major cause of postprandial heartburn and, thus, GERD.

G&H How effective is standard GERD therapy (ie, once-daily proton pump inhibitor therapy) for managing the acid pocket?

PK Proton pump inhibitors (PPIs) prevent acid secretion, which includes the formation of the acid pocket. The caveat to this is that the PPI has to be active at the time of the development of the acid pocket. This depends on when the PPI was dosed and on the half-life of the drug effect. On average, the half-life of a PPI in the serum is approximately 90 to 120 minutes, and the duration of this effect varies from 6 to 18 hours, depending on the drug and the person. Thus, a morning dose of a PPI may not be effective after dinner.

G&H What is the next step if standard PPI therapy is not effective for targeting the acid pocket?

PK PPI therapy should then be tailored to the patient. For example, a patient can take PPIs twice a day before meals to ensure that the agents will have a postprandial effect. Although PPIs are not currently approved by the US Food and Drug Administration for twice-daily use, it is common practice for patients to use that dosing regimen. It is one of the paradoxes that we constantly encounter in clinical practice that even though this dosing regimen is very common, we get endless phone calls from insurers about it.

The other scenario worth pointing out involves the patient who has only occasional breakthrough symptoms

attributable to the acid pocket and whether or not that would warrant increasing the dosage of a drug that is taken every day as opposed to using an as-needed treatment. In my opinion, this patient would be better managed with an as-needed treatment.

G&H Could you discuss any studies that have been conducted on other therapeutic targets for the acid pocket?

PK At this point, alginates have been studied the most because they have picked up on the concept of the acid pocket. Alginates are actually very appropriate in this setting, in the sense that they colocalize with the acid pocket. Alginate preparations, specifically Gaviscon (Reckitt Benckiser), create a gelatinous, floating material in the stomach that rises to the top, much the same as the acid pocket rises to the top of the stomach. Gaviscon also contains antacid to, in essence, neutralize the acid pocket. This has been shown experimentally. It also has been shown that Gaviscon is more effective than plain antacid in controlling postprandial acid reflux, primarily by this mechanism.

In terms of other agents, there has been a little research examining prokinetic agents, including an anti-biotic prokinetic, azithromycin, which appeared to have a small effect on displacing the acid pocket distally in patients with hiatal hernias. However, that finding is not very practical in a GERD management scenario because of the medication's side effects and antibiotic effect. To date, I am not aware of any other potential therapeutic options in the pipeline for addressing the acid pocket.

G&H Currently, how aware are community gastroenterologists about the acid pocket?

PK Awareness of the acid pocket is increasing largely because of a number of recent publications, such as the study conducted by Rohof and colleagues that was highlighted on the cover of the July 2014 issue of *Clinical Gastroenterology & Hepatology*. That paper emphasized the effectiveness of PPIs in reducing the volume of the acid pocket. I think that gastroenterologists are also paying more attention to the importance of the dosing schedule of PPIs because of heightened awareness of the need to control the acid pocket.

Also increasing is the awareness that alginates are different from antacids, although there is a caveat to this finding—the alginate most studied is Gaviscon Double Action (Reckitt Benckiser), which is a European preparation that differs from alginate preparations sold in the United States. Thus, US gastroenterologists may suggest that patients take the US preparation, hoping that it

is as effective as the European preparation, but the 2 preparations are made by different companies and are different formulations.

Nevertheless, it should be pointed out that some gastroenterologists still hold onto the concept that the acid pocket is an unusual or pathologic phenomenon, even though it is actually a matter of normal physiology. The acid pocket puts context around postprandial heartburn, explaining how and why it occurs. Some skeptical gastroenterologists think that the concept of the acid pocket is a recent discovery that requires rewriting physiology, but, in fact, this concept was described at the turn of the 20th century by Dr Walter Cannon, one of the fathers of physiology in the United States. Thus, it has been discovered before, and one could say that it has been recently rediscovered. It was thought to be pertinent to the development of peptic ulcer symptoms back then, but since GERD has become the acid peptic disease of this century, the acid pocket is quite relevant now as well; it is just a matter of integrating physiology into the practice of medicine.

G&H How can the acid pocket be best visualized?

PK Any method used to image acid secretion will enable visualization of the acid pocket as well. This includes pH monitoring in the proximal stomach, radionuclide scintigraphy, and magnetic resonance imaging with labeled acid. Of these tests, the most commonly performed is pH monitoring with an electrode in the proximal stomach; the other tests are not commonly used.

G&H What is the main focus of ongoing research in this area?

PK Much of the ongoing research has to do with examining the efficacy of alginate-antacid preparations and evaluating them as add-on therapies to PPIs. This has the potential to alter management strategies to some degree because it offers gastroenterologists an alternative to the tendency to escalate PPI doses, which is the current standard practice.

Dr Kahrilas has provided ad hoc consulting for AstraZeneca, Pfizer, and Trimeddyne; served on the advisory board for Reckitt Benckiser; and received research grant support (investigator-initiated protocols) from the National Institutes of Health.

Suggested Reading

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