Studies assess effectiveness of serotonin and nerve stimulants on

Studies have shown that gastrointestinal (GI) tract function is often influenced by specific stimulants or reactors, which sometimes cause irritable bowel syndrome (IBS) or constipation. Two studies presented at Digestive Disease Week 2007 (DDW) take a closer look at GI stimulation, including one examining the role of serotonin and reactions to certain types of foods and another looking at the potential therapeutic value of nerve stimulation for constipation. DDW is the largest international gathering of physicians and researchers in the fields of gastroenterology, hepatology, endoscopy and gastrointestinal surgery.

"We know that conditions of the bowel, such as constipation, diarrhea and irritable bowel syndrome, are quite troubling for a large number of individuals. These conditions can be highly volatile and unpredictable, but we are still trying to determine how we can manage these variables and what preventive or treatment options may help patients who suffer from these conditions," said Alan Buchman, M.D., MSPH, AGAF, Feinberg School of Medicine of Northwestern University School of Medicine. "These two studies point to options that may help doctors manage symptoms in their patients and hopefully lead to better treatment options in the future."

Olfactory receptors on human intestinal enterochromaffin (EC) cells function as sensors for spices and odorants (Abstract W1581)

One primary research focus in GI disorders is how and why the system reacts to certain foods or other stimulants; specifically, researchers are investigating the primary factors responsible for regulating digestion. Enterochromaffin (EC) cells, which are present throughout the digestive system, release serotonin (a chemical associated with the etiology of various diseases such as migraine, diarrhea, respiratory disturbances and hypertension) and are important in regulating gut motility. Researchers from the Technical University of Munich and the Ludwig Maximillian University of Munich in Germany investigated whether EC cells in the intestine express nasal olfactory receptors (ORs, receptors used for smelling) to determine whether odorants present in spices, fragrances, cigarettes, detergents and cosmetics may cause serotonin release, thereby provoking a GI response.

To evaluate this connection, researchers studied human EC cells isolated from mucosal biopsies by laser microdissection and an EC derived cell line. The experiments revealed expression of several ORs in the isolated EC cells, as well as the cell line. Using digital fluorescence imaging, the team found that activation of the cells with odorants caused elevation of intracellular Ca^{2+}, followed by serotonin release up to ten-fold that of the controls. Odorants like thymol (thyme), eugenol (cloves), bourgeonal (floral, lily-of-the-valley), helional (brown algae) and substances present in roses, bananas or raspberries, specifically, caused an elevation of Ca^{2+} levels.

The findings suggest that these types of odorants may cause a serotonin-related GI reaction. The effects could be inhibited by known OR antagonists, such as methyl isoeugenol (a competitive antagonist of eugenol) or by blocking Ca^{2+} influx (e.g., via Ca^{2+} channels with nifedipine, a drug used in the treatment of hypertension because it relaxes blood vessels).

"Our results show that odorants present in the gut may stimulate serotonin release via olfactory receptors expressed in human enterochromaffin cells in the gut mucosa," said Petra Voland, Ph.D., of the Technical University of Munich, and one of the lead investigators of the study. "Serotonin controls peristalsis and is implicated in pathological conditions such as vomiting, diarrhea and irritable bowel syndrome. Thus, olfactory receptors are potential novel targets for the treatment of gastrointestinal diseases and motility disorders."

Sacral nerve stimulation for constipation: an international multi-centre study (Abstract 198)

In patients with idiopathic constipation, which occurs with no identifiable cause, in whom conservative treatment has failed, surgical procedures (e.g., colectomy) are associated with a high failure rate and substantial morbidity. Researchers from five European sites set out to explore an alternative approach: modulating the extrinsic nerve supply to the bowel. In doing so, investigators evaluated the symptomatic response and physiological effect of sacral nerve stimulation in patients with slow transit constipation and normal transit constipation with impaired evacuation.

In this prospective, multi-center trial, 65 patients (58 female) who failed treatment with laxatives and biofeedback (retraining pelvic floor muscle coordination using exercises and electronic aids that create feedback when successful muscle contraction occur) underwent test stimulation, each serving as their own control. The effect of temporary sacral nerve stimulation was assessed by a 21-day bowel habit diary. Patients with more than 50 per cent improvement in symptoms were eligible for permanent stimulation. Long-term results were assessed by: bowel habit diary, symptom questionnaire, Cleveland Clinic constipation score (CCCS), visual analogue score (VAS) and short form-36 (SF-36) quality of life questionnaire. Primary endpoints included an increase in the frequency of defecation, reduction in straining and reduction in the sensation of incomplete evacuation.

After a median follow up of 12 months, subjects with both slow transit and impaired evacuation benefited from therapy and 43 patients (66 per cent) proceeded to chronic stimulation. Frequency of defecation increased from 3.4 to 6.1 times per week, while evacuation days per week increased from

2.4 to 4.4. Time spent in facilities decreased from 17.6 to 9.3 minutes, straining decreased from 4.4 to 2.9 episodes per week, abdominal pain decreased from 4.4 to 2.0 days per week, and perception of incomplete evacuation decreased significantly.

In evaluating the results of the various assessment tools set forth at the start of the trial, researchers found that: the CCCS (0=no constipation, 30=severe constipation) decreased from 18.0 to 10.2; mean VAS (0=severe symptoms, 100=no symptoms) increased from 18 to 66; and SF-36 subsets of physical functioning, general health, vitality, social functioning and mental health significantly improved.

"While constipation is rarely life-threatening, associated symptoms of abdominal pain, bloating and the sensation of incomplete evacuation can severely affect the physical and emotional well-being of patients. There are many treatment options for the condition and the best approach relies on a clear understanding of the underlying cause," said Thomas Dudding, M.D., of St. Mark's Hospital in London, England, and lead investigator for the study. "This study found that sacral nerve stimulation is an effective treatment for idiopathic constipation that is resistant to conservative treatment. As a result of this stimulation process, improvement occurs in bowel frequency, associated symptoms and overall quality of life."

Source: American Gastroenterological Association Related Products

About the Author

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Only take this Imitrex medicine when a migraine attack occurs. Imitrex Storage Keep this Imitrex medicine in its container, at normal temperature.

Headache is a pervasive symptom and the most common problem neurologists encounter in their clinical.

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A variety of pharmacologic and nonpharmacologic modalities have been used in attempts to reduce the number of attacks in migraine.

Information about migraine headaches from the American Academy of Family. Medicine to prevent migraines may be helpful if your headaches.

Migraine headaches cause severe pain and tremendous disability, and yet less than half of all people who suffer from these disabling headaches.

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