The Diagnosis of Endometriosis by Electroenterography: A Disease of Insulin Sensitivity.


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Introduction:

Neuromuscular dysfunction of the enteric nervous system (ENS) is a common problem in women with endometriosis (ENDO). These patients often complain of chronic abdominal pain, nausea, vomiting, early satiety, bloating and altered bowel habits. We have reported characteristic changes in motility of the ENS by antroduodenal manometry (Fert & Steril 70:80-85;1998) and by electrogastrography (Gastro 118:A821; 2000). We have also reported that ENDO is a disease of impaired glucose transport resulting in an imbalanced eicosanoid system and excess production of 2 pathway prostaglandins.

The purpose of the following study was to assess the electrical activity of the enteric nervous system (the brain in the bowel) using electroenterography (EEG) a new technology developed by The 3CPM Company, Inc. for JRM that records the electrical activity of the enteric nervous system. This technology measures activity that is 30 Hz or less and, unlike electrogastrography, measures the frequencies from 0 to 50 cycles per minute. We had previously documented that the abnormal contractile (mechanical) frequencies of the small intestine in women with ENDO were approximately 20 and/or 40 contractions per minute using antroduodenal manometry (Dig Dis & Sci 40:1710-1719, 1995). We postulated that electrogastrography alone would not assess these faster frequencies. Patients and Methods: One thousand women with unexplained abdominal pain, nausea, and/or altered bowel habits and with documented ENDO by laparoscopy were recorded from 2001 to 2007. Each patient was recorded with bipolar electrodes for 15 minute baseline and then they were given water to drink until full; they were recorded for an additional 30 minutes. The recording was analyzed by software developed by The 3CPM Company, Inc.

We have identified two characteristic patterns that are diagnostic of endometriosis, Figure 1 shows a representative tracing from a control subject. The horizontal axis depicts electrical frequency in cycles per minute (cpm) and the vertical axis depicts a running spectral analysis in time. This format will be used in all tracings. Normal 3 cpm activity is seen with minimal electrical dysfunction in the stomach. Figure 2 shows a representative tracing from a patient with ENDO; continuous electrical dysfunction is shown consisting of multiple frequencies from 0 to 50 CPM that we have called enteric nerve fibrillation. Figure 3 shows a representative tracing from a patient with ENDO; it shows changes in the pacemaker frequencies of the ENS and consists of a cluster of electrical activity classically seen from 15-18 cpm and from 30-33 cpm. These are ectopic pacemakers that may be seen in patients with ENDO or from viral infections that cause
gastroenteritis. These patterns result in spasm of the circular muscle of the intestine causing symptoms of abdominal pain, nausea, and/or altered bowel habits.

**Conclusions:**

1. Electroenterography is new technology that accurately assesses the electrical activity of the enteric nervous system in patients with endometriosis.
2. The diagnosis in young women with unexplained symptoms of abdominal pain may be established without surgical intervention and in the majority of cases medical therapy alone may be successful in controlling their disease.

**Figures:**