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Research Article

Motor Function of the Gastrointestinal Tract and Biliary Tract in Mesenteric Lymphadenitis

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Abstract

Lymphadenitis is an inflammation of the lymph nodes that occurs as a complication after various inflammatory diseases and specific infections and is usually a secondary process. The main cause of acute mesenteric lymphadenitis is considered to be adenovirus infection [1], including in children [2]. However, under the mask of acute mesenteric lymphadenitis, malignant neoplasms and specific (tuberculosis, AIDS, syphilis) lesions of the lymphatic nodes of the peritoneum and retroperitoneal space, as well as autoimmune non-specific diseases of the abdominal cavity can occur.

Keywords: *Mesenteric Lymphadenitis (ML); Gastrointestinal Tract; Biliary Tract*

Introduction

Mesenteric lymphadenitis (ML) of the mesentery lymph nodes can occur with tuberculous intestinal damage, but sometimes occurs without specific intestinal damage [3]. The diagnosis is made in the absence of symptoms of tuberculosis intoxication: fever, sweating, decreased appetite, body weight, fatigue, changes in heart rate and changes in blood parameters. Among the intestinal symptoms, there is no prolonged diarrhea.

Most often, the introduction of a provoking agent occurs against the background of local inflammatory processes, acute, subacute or chronic, sometimes with infectious diseases. Penetration of the pathogen is possible with its direct contact, through the lymph and blood. Against the background of the pathological process, pathogens arrive in large quantities, which causes proliferation of lymphocytes and an increase in the size of the lymph node.

The direct cause of lymphadenopathy may be:

- Giardia, toxoplasma and other protozoa,
- Helminths,
- Fungal infections,
- Pathogenic bacterium,
- Viruses.

Clinically, acute mesenteric lymphadenitis is manifested by non-localized pain mainly in the mesogastrium, characterized by Vilensky syndrome (abdominal pain with vomiting, palpatory soreness in the right iliac region and epigastrium, leukocytosis up to 17 - 20 thousand people). The patient cannot determine the duration of the disease-usually 2 - 3 days. The temperature response varies from normal to hyperthermic, there are no characteristic symptoms of stool disorders.

Clinically, acute mesenteric lymphadenitis is characterized by polymorphic onset, has a long-lasting character, and the clinical picture is erased - catarrhal phenomena and herpetic infection are often present when the disease is seasonal-in the spring at the height of flu and SARS diseases or during the beginning of the school year for students and students.

ML is manifested by pain around the navel, which increases with walking and physical exertion. Palpation pain is localized in the projection of the mesentery root. As the process progresses, pain appears in the right iliac region. Endoscopic ultrasound scans visualize the intestinal wall in layers and reveal lymph nodes in mesenteric lymphadenitis [4]. Endoscopic ultrasound scans visualize the mesenteric lymph nodes, but the functional state of the gastrointestinal tract (GI) and biliary tract (VD), in particular, their motor function, has not been sufficiently studied.

The use of ultrasound diagnostics of diseases of the abdominal cavity made it possible to detect an increase in mesenteric lymph nodes, followed by the use of computed tomography if a tumor or metastatic process is suspected.

A significant role in the clinical picture of mesenteric lymphadenitis is played by the influence of enlarged lymph nodes on the propulsive activity of the gastrointestinal tract and biliary tract. No such studies have been found in the available literature.

Aim of the Study

The aim is to identify violations of the motor function of the gastrointestinal tract and VD in mesenteric mesentery lymphadenitis.

Materials and Methods

The study included 10 ML patients aged 32 ± 3.6 years. Patients reported pain in the right and left iliac region in 80% of cases, diarrhea and flatulence in 60% of cases, constipation in 40%, hepatomegaly, gall bladder dyskinesia and biliary sludge in 20%. The diagnosis of ML was established by ultrasound examination. The comparison group consisted of 9 patients suffering from GERD.

Motor function of the gastrointestinal tract and VD was recorded electromyographically by placing bipolar silver electrodes on the anterior abdominal wall in the projection area of the registered organ. The amplitude-frequency parameters of slow waves and spikes, the power of phase and tonic contractions and propulsive activity were analyzed using the Conan-M hardware and software package with a bandwidth of 0.1 - 10 mV.

Statistical processing was performed using the Statistica-15 software package.

Results

The frequency of slow stomach waves was 11.1 ± 0.8/min (an increase of 100.1%, $p < 0.004$), the amplitude was 0.13 ± 0.002 mV (a decrease of 13.3%, $p < 0.005$), the power of tonic contractions was 1.443 ± 0.12 (an increase of 74.9%, $p < 0.05$). The frequency of spikes was 4.4 ± 0.5 (an increase of 340%, $p < 0.001$), the amplitude was 0.03 ± 0.002 mV (a decrease of 70%, $p < 0.05$), the power of phase contractions was 0.132 ± 0.11 (an increase of 32%, $p < 0.05$) and the propulsive activity was 10.93 ± 1.05 (an increase of 32.4%, $p < 0.05$). That is, with MA, hypermotor dyskinesia of the stomach is observed.

Electromyographically, the frequency of slow duodenal waves was 17.1 ± 0.6/min (a decrease of 22.3%, $p < 0.05$), the amplitude was 0.15 ± 0.003 mV (an increase of 49.9%, $p < 0.05$) and the power of tonic contractions was 2.565 ± 0.25 (an increase of 12.4%, $p < 0.05$). The rate of spikes was 3.4 ± 0.2 (an increase of 240%, $p < 0.001$), amplitude of 0.02 ± 0,0012 mV (a decrease of 79.9% of, $p < 0.05$), the power phase of reductions 0,068 ± 0,0024 (reduction 32%, $p < 0.05$), the propulsive activity of 39 ± 0,6 (increased by 81.3%, $p < 0.05$). That is, the propulsive activity of the duodenum is increased due to the low power of phase contractions of the circular muscles.

The frequency of slow waves of the jejunum was 18.3 ± 0.7/min (decrease by 8.5%, $p < 0.05$), the amplitude of 0.12 ± 0.004 mV (increase by 20%, $p < 0.05$), the power of tonic contractions 2,196 ± 0.175 (decrease by 0.4%, $p > 0.1$). The rate of spikes was 3.0 ± 0,06 (increase 198,9%, $p < 0.001$), amplitude - 0,04 ± 0,002 mV (reduction 60%, $p < 0.05$), the power phase of the cuts – 0,12 ± 0,003 (increase 20%, $p < 0.05$), the propulsive activity of 17.5 ± 1,2 (a decrease of 12.5%, $p < 0.05$). That is, the propulsive activity of the jejunum is reduced due to the high frequency of spikes in the circular muscle layer.

Electromyographically, the frequency of slow waves of the right colon was 12.0 ± 0.9/min (an increase of 9.1%, $p < 0.05$), the amplitude of 0.09 ± 0.003 mV (a decrease of 10%, $p < 0.05$), the power of tonic contractions - 1.08 ± 0.065 (a decrease of 8.4%. $p < 0.05$). The frequency of spikes was 4.1 ± 0.08 (increase by 310%, $p < 0.001$), the amplitude was 0.03 ± 0.004 mV (decrease by 70.1%, $p < 0.05$), the power of phase contractions was 0.123 ± 0.011 (increase by 13%, $p < 0.05$), and the propulsive activity was 8.8 ± 0.51 (decrease by 20%, $p < 0.05$). The propulsive activity of the right colon is reduced due to the high frequency of spikes in the circular muscle layer.

Electromyographic frequency of slow waves of the left colon (proximal part) it was 9.2 ± 0.4/min (increase by 53.3%, $p < 0.05$), the amplitude was 0.09 ± 0.006 mV (decrease by 10%, $p < 0.05$), the power of tonic contractions was 0.828 ± 0.041 (increase by 38%, $p < 0.05$). The frequency of spikes was 3.4 ± 0.5 (increase by 240%, $p < 0.001$), the amplitude was 0.05 ± 0.004 mV (decrease by 70.1%, $p < 0.05$), the power of phase contractions was 0.102 ± 0.011 (increase by 0.2%, $p > 0.1$), and the propulsive activity was 8.12 ± 0.5 (increase by 35.3%, $p < 0.05$). That is, in the proximal part of the descending colon, increased propulsive activity is determined by a high frequency of spikes in the circular muscle layer.

The frequency of slow waves of the sigmoid colon is 7.6 ± 0.1/min (an increase of 52%, $p < 0.05$), the amplitude is 0.12 ± 0.003 mV (an increase of 20%, $p < 0.05$), the power of tonic contractions is 0.912 ± 0.032 (an increase of 82.4% $p < 0.05$). The frequency of spikes was 3.6 ± 0.07 (an increase of 260%, $p < 0.001$), the amplitude was 0.03 ± 0.004 mV (a decrease of 70.1%, $p < 0.05$), the power of phase contractions was 0.108 ± 0.012 (an increase of 0.8%, $p > 0.1$), and the propulsive activity was 8.4 ± 0.4 (an increase of 68.8%, $p < 0.05$). Thus, hypermotor dyskinesia of the sigmoid colon was observed, which contributes to the development of diarrhea.

The frequency of slow choledoch waves at MA was 9.7 ± 0.6/min (an increase of 7.9%, $p < 0.05$), the amplitude was 0.11 ± 0.004 mV (an increase of 10%, $p < 0.05$), the power of tonic contractions was 1.185 ± 0.07 (an increase of 37%, $p < 0.05$). The frequency of spikes is 4.4 ± 0.3 (increase by 340%, $p < 0.05$), the amplitude is 0.04 ± 0.005 mV (decrease by 60%, $p < 0.05$), the power of phase contractions is 0.176 ± 0.013 (increase by 76%, $p < 0.05$), and the propulsive activity is 6.73 ± 0.45 (increase by 10.1%, $p < 0.05$). Thus, the propulsive activity of the choledochus is determined by the ratio of slow waves and spikes and is biased towards hypermotor dyskinesia.

Electromyographically, the frequency of slow gallbladder waves was 6.9 ± 0.5/min (13.8% decrease, $p < 0.05$), the amplitude was 0.11 ± 0.003 mV (10% increase, $p < 0.05$), the power of tonic contractions was 0.759 ± 0.0315 (5.1% decrease, $p < 0.05$). The frequency of spikes was 3.8 ± 0.4 (an increase of 280%, $p < 0.001$), the amplitude was 0.02 ± 0.003 mV (a decrease of 80.1%, $p < 0.05$), the power of phase contractions was 0.076 ± 0.005 (a decrease of 24%, $p < 0.05$) and the propulsive activity was 9.98 ± 0.73 (an increase of 99.3%, $p < 0.05$). That is, in ML, hypermotor dyskinesia of the biliary system was observed, which increases the passage of bile into the intestine and increases the propulsive activity of the intestine.

Discussion

With ML, there are marked violations of the motor function of the gastrointestinal tract and VD; and significantly increased motor function of the stomach, left colon, gall bladder and duodenum, which may be associated with compression of the small lymph nodes of the small intestine, choledochus. As a result, there is a marked decrease in jejunal motility, which may also be associated with the development of SIBR, which ultimately contributes to the development of hypermotor dyskinesia of the left colon and the development of diarrhea.

Conclusion

1. Electromyography can be used to study the motor function of the gastrointestinal tract and VD in mesenteric lymphadenitis.
2. Hypermotor dyskinesia of the stomach and biliary system and duodenum was Detected, which may be due to the influence of lymph node conglomerates.
3. hypomotor dyskinesia of the jejunum and right colon was Detected, which may be due to the development of intestinal dysbiosis.
4. Hypermotor dyskinesia of the distal colon, identified in the present study, causes the development of diarrhea.

Conflict of Interest

The authors report no conflict of interest.

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