

**Original article**

**The features of psycho-vegetative disorders and their role in the pathogenesis of gastroesophageal reflux disease with obesity**

Oparin A<sup>1</sup>, Kornienko DA<sup>2</sup>, Oparin AG<sup>3</sup>, Lavrova NV<sup>4</sup>, Dvoyashkina JF<sup>5</sup>, Khomenko LA<sup>6</sup>

**Abstract:**

**Background:** Gastroesophageal reflux disease (GERD) is a disease of the XXI century, affecting the population in the developed countries. There is a clear tendency to increasing of gastroesophageal reflux disease among people of young age. **Aim:** The aim of the study is to determine the characteristics and role of psychosomatic and vegetative state disorders in the pathogenesis of GERD with concomitant obesity. **Materials and methods:** 50 young patients with GERD were examined during the study. Depending on the presence or absence of concomitant obesity, two groups were formed. They underwent pH-metry, ultrasonic scanning. State of psychosomatic, vegetative statuses and quality of life we determined by the questionnaires of Beck, Spielberg, Sheehan, Wayne. **Results:** During the ultrasound examination we determined the esophageal opening diameter, the thickness of esophageal wall, the esophagus width in the lower one third of the esophagus differed significantly in 2 groups of patients ( $p < 0.05$ ). In the group of the GERD patients with concomitant obesity the sharp increase of depression level was found, comparing with both the standard and the second group ( $p < 0.05$ ). It wasn't found the significant difference amount other figures of vegetative and psychosomatic statuses in 2 groups of patients ( $p > 0.05$ ). The patients with GERD of both groups had significantly higher level of motor-evacuation and psycho-vegetative disorders comparing with healthy people ( $p < 0.05$ ). **Conclusion:** GERD patients have pronounced motor-evacuation disorders and significantly greater manifestations of psycho-vegetative disorders which were more pronounced in gastroesophageal reflux disease patients with concomitant obesity.

**Keywords:** gastroesophageal reflux disease; obesity; psychosomatic status; vegetative status

DOI: <http://dx.doi.org/10.3329/bjms.v14i2.20272>

Bangladesh Journal of Medical Science Vol.14(2) 2015 p.142-145

**Introduction:**

According to recent epidemiological data, there is a clear tendency to increasing of gastroesophageal reflux disease (GERD) rate<sup>1,2</sup> and its spreading espe-

cially among young people. At this stage, GERD is not only a medical but also a social problem, leading to the formation of significant complications, including Barrett's esophagus, the decrease of quality of

1. Alex Oparin, Professor, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv
2. Daria Kornienko, PhD student, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv Medical Academy of Postgraduate Education, Kharkiv, Ukraine
3. Anatoliy Oparin, Associate Professor, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv
4. Nataly Lavrova, Associate Professor, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv
5. Julia Dvoyashkina, Associate Professor, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv
6. Ludmila Khomenko, Assistant of the Department, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv

**Corresponds to:** Daria Kornienko, PhD student, Dept of Therapy, Rheumatology and Clinical Pharmacology, Kharkiv Medical Academy of Postgraduate Education, Ukraine, Kharkiv, st. Korchagincev 58, 611176, Email: kornienkodd@gmail.com.

life similar to mental illnesses<sup>3</sup>.

GERD is also an economic problem caused by the necessity of a long and very expensive treatment that does not always take into account the presence of comorbidity. Today the prompt comprehensive diagnostic, prevention and treatment of gastroesophageal reflux disease are among the most important problems in the clinic of internal diseases<sup>2,3</sup>. At the same time, a number of patients with GERD with comorbid disorders, including obesity, is growing<sup>4-6</sup>. Overweight and obesity trigger the development of both short- and long-term adverse effects on the physical and psychosocial health, strengthen disorders of emotional and vegetative state, which occur in gastroesophageal reflux disease.

The aim of the study is to determine the characteristics and role of psychosomatic and vegetative state disorders in the pathogenesis of GERD with concomitant obesity.

### **Materials and methods:**

#### ***Subjects***

This study was conducted at the gastroenterological departments of Kharkiv Medical Academy of Postgraduate Education and City Student Hospital, Kharkiv.

The diagnosis of GERD is established according to ICD-10 based on a detailed survey, evaluation of complaints, history of the disease and the patient's life. For diagnosis was performed following condition: the presence of heartburn that bothers the patient, one or more times a week for the past 6 months (as recommended by the Mayo Clinic and the Montreal Consensus, 2005), as well as the data endoscopy, radiological and pH-metric methods. Medical history of GERD ranged from 1 year to 4 years.

The criteria for exclusion from the examination can be regarded as the presence of neoplastic lesions in the patient's digestive tract, Barrett's esophagus, active stomach ulcers or duodenal ulcers, or postponed surgery on the organs of the alimentary canal.

The study was approved by the Institutional Ethic Committee of Kharkiv Medical Academy of Postgraduate Education and City Student Hospital. Written informed consents were obtained from all the subjects.

We made a comprehensive examination of 50 young patients with GERD. Depending on the presence or absence of concomitant obesity, two groups were formed. The first group included patients with GERD and obesity, 14 (56%) men and 11 (34%) women aged from 19 to 27 years old, the average age was 22±1.96 years old.

The second group included patients with GERD without comorbidity, 15 (60%) men and 10 (40%) women aged from 18 to 25 years old, the average age was 21±0.56 years old.

To estimate gastric secretion, the intragastric pH-metry method was used with application of calomel-antimony electrodes (antral and framed) on the AI-2 (the Acidity Indicator machine, made in Ukraine) with the standard method.

To investigate motor activity disorders, the ultrasonic scanning was made on the machine ALOKA SSD-650 (made in Japan) on an empty stomach, and in 5, 10 and 15 minutes after intake of 0.5 liters of fluid. We determined the diameter of esophageal opening (hiatus esophageus) (normal 1.51±0.05 cm) the thickness of the esophagus wall (normal 0.31±0.02 cm), the esophagus width in the lower one third of the esophagus (normal 2.13±0.16 cm), and also the presence or absence of reflux (reverse fluid flowing from the stomach into the esophagus).

The presence of obesity, is established after getting anthropometric measurements of height and body weight of the patient, and the calculation of their body mass index (BMI) using conventional methods. BMI is calculated by the Quetelet formula as the ratio of weight in kilograms to the square of height in meters (kg/m<sup>2</sup>). We can consider a patient 'obese' if their BMI is bigger than 25 (as concluded by WHO). State of psychosomatic status we determined by the questionnaires of Beck, Spielberg, Sheehan.

The vegetative nervous system was investigated with the help of Wayne questionnaire, taking into account the frequency of subjective vegetative symptoms, such as headache, weakness, dizziness, lethargy, emotional lability, rapid fatigability and sweating.

As the standard, we took mean values of 20 healthy students of the same age and sex who were the control group (14 men and 6 women) aged 18 to 24.

We processed the research results by the variation statistics method with application of correlation analysis standard programs with M, m average values calculation. Results were expressed as mean±standard deviation (SD). Student's t-test was performed to assess the reliability indices. Pearson's correlation coefficients (r) was used to identify the associations between figures. With 95% confidence interval (CI), statistical significance was defined as a p<0.05.

### **Results and Discussion:**

The main symptoms noticed by patients were heartburn (90% of the cases), pain in the epigastric region (80%), regurgitation (60%), extraesophageal manifestations of GERD (20%), dysphagia (6%).

During the ultrasound examination we determined the esophageal opening diameter (normal  $1.51 \pm 0.05$  cm, the patients of the first group  $2.03 \pm 0.15$  cm, the second group  $1.79 \pm 0.09$  cm), the thickness of esophageal wall (normal  $0.31 \pm 0.02$  cm, the patients of the first group  $0.46 \pm 0.03$  cm, the second group  $0.40 \pm 0.04$  cm), the esophagus width in the lower one third of the esophagus (normal  $2.13 \pm 0.16$  cm, the patients of the first group  $2.9 \pm 0.2$  cm, the second group  $2.56 \pm 0.26$  cm) ( $p < 0.05$ ) and the presence or absence of reflux (reverse fluid flowing from the stomach into the esophagus).

The study found that concomitant obesity aggravates the clinical manifestations of GERD, ultrasonic parameters and causes higher levels of depression<sup>6,7</sup>.

**Table I: Frequency Indices of Subjective Vegetative Manifestations in Groups**

Complaints Of patients	GERD Patients with concomitant obesity (%)	GERD Patients without comorbidity (%)
Headache	40	44
Weakness	65	52
Dizziness	45	48
Drowsiness	69	35
Emotional lability	57	40
Sweating	60	34
Rapid fatigability	67	45

In the group of the GERD patients with concomitant obesity the sharp increase of depression level was found<sup>8</sup>, comparing with both the standard and the second group ( $20 \pm 3.72$  points at the first group and  $14.72 \pm 3.3$  – at the second group according to the Beck’s scale, that corresponds to moderate depression level and significantly higher than in healthy individuals) ( $p < 0.05$ ). Also, the patients had high level of anxiety, which reached  $41.28 \pm 5.82$  points for personal anxiety and  $40.36 \pm 6.68$  points for reactive one in the first group and  $40.12 \pm 7.18$  points for personal anxiety and  $38.24 \pm 8.3$  for reactive anxiety in the second group. On the average, in the first group the self-esteem alarm indicator according to the Sheehan’s scale was  $56.36 \pm 9.95$  points and  $50.88 \pm 15.31$  - in the second group, corresponding to abnormal levels of anxiety and significantly higher ones, than in the group of healthy individuals ( $p > 0.05$ ).

At the same time, we thoroughly studied the vegetative status, investigated the frequency of subjective autonomic symptoms, such as headache, weakness, dizziness, emotional lability, fatigue and sweating. It was found that the general vegetative tone of 48% of patients from the first group and 53% patients from the second group was shifted accordingly toward parasympathotonia. The most severe complaints of the gastroesophageal reflux disease patients with concomitant obesity were about emotional lability, rapid fatigability and sweating, comparing with the

**Table II: Indices of GERD patients with concomitant obesity and GERD patients without comorbidity compared with the control group**

Indices	Standard	GERD Patients with concomitant obesity	GERD Patients without comorbidity
Diameter of hiatus (cm)	$1.51 \pm 0.05$	$2.03 \pm 0.15^*$	$1.79 \pm 0.09$
The thickness of the esophageal wall (cm)	$0.31 \pm 0.02$	$0.46 \pm 0.03^*$	$0.40 \pm 0.04$
The esophagus width in the lower one third of the esophagus (cm)	$2.13 \pm 0.16$	$2.9 \pm 0.2^*$	$2.56 \pm 0.26$
The level of depression (Beck’s scale)	$6.8 \pm 2.53$	$20 \pm 3.72^*$	$14.72 \pm 3.3$
The level of personal anxiety (according to Spielberg)	$22.3 \pm 2.74$	$41.28 \pm 5.82$	$40.12 \pm 7.18$
The level of reactive anxiety (according to Spielberg)	$22.3 \pm 4.32$	$40.36 \pm 6.68$	$38.24 \pm 8.3$
The level of self-esteem anxiety (according to Sheehan)	$21.3 \pm 2.56$	$56.36 \pm 9.95$	$50.88 \pm 15.31$

\* -  $p < 0.05$

GERD patients without comorbidity. Thus, we found the reliable differences in the indices of the ultrasound examination and psychosomatic condition of the GERD patients with concomitant obesity compared with the control group, and we did not find any significant differences in the indices between the patients of the first and second groups.

#### **Conclusions:**

1. It was shown that GERD patients have pronounced motor-evacuation disorders, which were significantly more pronounced in gastroesophageal reflux disease patients with concomitant obesity.

2. GERD patients with concomitant obesity had significantly greater manifestations of psycho-vegetative disorders comparing with GERD patients without comorbidity. Thus, GERD patients with concomitant obesity have much higher level of depres-

sion comparing with the control group, and the group of GERD patients without comorbidity.

3. We found the clear correlation between features of vegetative and psychosomatic disorders and characteristics of the motor-evacuation disorders of the gastrointestinal tract of GERD patients with concomitant obesity.

4. The obtained results let us to consider the psycho-vegetative disorders as a factor that leads to motor-evacuation disruption of the gastrointestinal tract function, which takes one of the leading places in the GERD pathogenesis.

5. The obtained data allow us to develop additional pathogenetic therapy, applying the means of correcting the motor-evacuation disorders, emotional and autonomic disorders of GERD patients with concomitant obesity.

---

#### **Reference:**

1. Wu YW, Tseng PH, Lee YCh, Wang SY, Chiu HM, Tu CH et al. Association of Esophageal Inflammation, Obesity and Gastroesophageal Reflux Disease: From FDG PET/CT Perspective. *PLoS One* 2014; **9** (3) <http://dx.doi.org/10.1371/journal.pone.0092001> <http://dx.doi.org/10.1371/journal.pone.0092001>
2. Vakil N., van Zanten SV, Kahrilas P., Dent J, Jones R. The Montreal definition and classification of gastroesophageal reflux disease: a global evidence-based consensus. *Am J Gastroenterol* 2006; **101**: 1900–20. <http://dx.doi.org/10.1111/j.1572-0241.2006.00630.x> <http://dx.doi.org/10.1111/j.1572-0241.2006.00630.x>
3. Boeckxstaens G., El-Serag HB, Smout A., Kahrilas P. Symptomatic reflux disease: the present, the past and the future. *BMJ* 2014; **63**(7): 1185–93. <http://dx.doi.org/10.1136/gutjnl-2013-306393> <http://dx.doi.org/10.1136/gutjnl-2013-306393>
4. Friedenberg FK, Xanthopoulos M., Foster GD, Richter JE The association between gastroesophageal reflux disease and obesity. *Am J Gastroenterol* 2008; **103**: 2111–22. <http://dx.doi.org/10.1111/j.1572-0241.2008.01946.x> <http://dx.doi.org/10.1111/j.1572-0241.2008.01946.x>
5. Kahrilas PJ, Jonsson A., Denison H., et al. Impact of regurgitation on health-related quality of life in gastro-oesophageal reflux disease before and after short-term potent acid suppression therapy. *Gut* 2014; **63**:720–26. <http://dx.doi.org/10.1136/gutjnl-2013-304883> <http://dx.doi.org/10.1136/gutjnl-2013-304883>
6. Dixon JB, Dixon ME, O'Brien PE Depression in association with severe obesity: changes with weight loss. *Arch Intern Med* 2003; **163**:2058–65. <http://dx.doi.org/10.1001/archinte.163.17.2058> <http://dx.doi.org/10.1001/archinte.163.17.2058>
7. Marcowitz S., Friedman M., Arent S. Understanding the relation between obesity and depression: causal mechanisms and implications for treatment. *Clin Psychol Sci Prac* 2008; **15**:1-20. <http://dx.doi.org/10.1111/j.1468-2850.2008.00106.x> <http://dx.doi.org/10.1111/j.1468-2850.2008.00106.x>
8. Lim CH, Choi MG, Baeg MK, Moon SJ, Kim JS, Cho YK et al. Symptom characteristics and psychosomatic profiles in different spectrum of gastroesophageal reflux disease. *Gut Liver*. 2014; **8**(2):165-69. <http://dx.doi.org/10.5009/gnl.2014.8.2.165> <http://dx.doi.org/10.5009/gnl.2014.8.2.165>