

Estimation of autonomic nervous system activity by heart rate and blood pressure variability in patients with gastric and colorectal cancer. Preliminary study.

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Background: Parameters of spectral domain analysis of heart rate (HRV) and blood pressure (BPV) variability are method used to evaluation of autonomic nervous system (ANS) condition. Investigation of the relationship among cardiovascular autonomic system activity and gastric and colorectal cancer has been very seldom so far.

Purpose: The evaluation of disturbances in autonomic system using HRV in patients with gastric and colorectal cancer.

Patients and methods: Fourteen patients (out of planned 90) with gastric or colorectal cancer and 30 healthy persons were enrolled to this study. Every patient underwent surgical operation due to gastric or colorectal cancer. The ANS activities were measured by heart rate and blood pressure variability. At rest condition ECG and blood pressure were recorded with spectral domain analysis of HRV and BPV (Task Force Monitor 3040i, CNSystems, Austria).

In analysis were used the following parameters LF – power of the low frequency component (0.04 – 0.15 Hz), HF – power of high frequency component (0.15 – 0.4 Hz), LF/HF ratio – ratio of LF to HF. The study was approved by local medical ethics committee. Each patient signed informed consent. Patient characteristics is presented in table 1.

Table 1 . Patient characteristics	n=14
sex	M : F = 8 (57.1%) : 6 (42.9%)
median age (range)	62.9 years (40-85 years)
primary site	stomach – 5 (35.7%) colon - 5 (35.7%) rectum - 4 (28.6%)
kind of surgical treatment	gastrectomy – 4 (21.4%) hemicolectomy – 3 (28.6%) abdominal- perineal amputation of rectum - 3 (28.6%) hemicolectomy and anterior resection of rectum -1 (7.1%) hemicolectomy and excision of recurrence – 1 (7.1%) anterior resection of rectum – 1 (7.1%) explorative laparotomy -1 (7.1%)
radical surgical treatment	YES- 9 (64.3%) NO - 5 (35.7%)
radiotherapy	YES - 3 (21.4%) NO - 11(78.6%)

Results: The resting HRV parameters of the cancer patients, LF and HF, were lower than in the controls (LF 306±151 vs. 1413±1120, p=0.002; HF 324±285 vs. 1882±1540, p=0.004) (Fig.1); the LF/HF ratio was higher in the cancer group (LF/HF 2.43±1.5 vs. 1.22±1.06, p=0.02) (Fig. 2). In BPV parameters were similar changes but not significant. The above mentioned differences corresponded to disturbances of the parasympathetic-sympathetic balance, namely to sympathetic overactivity in patients.

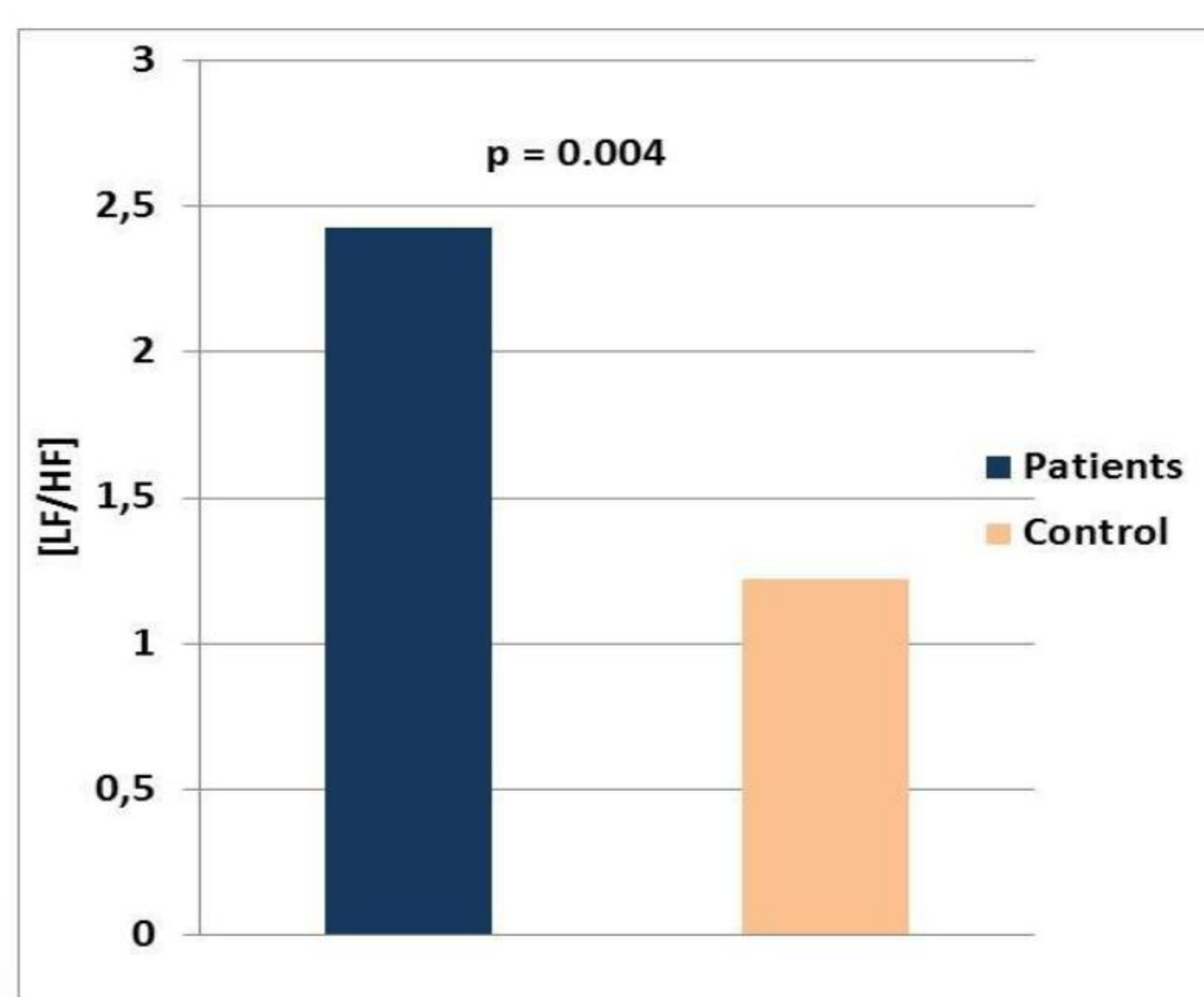
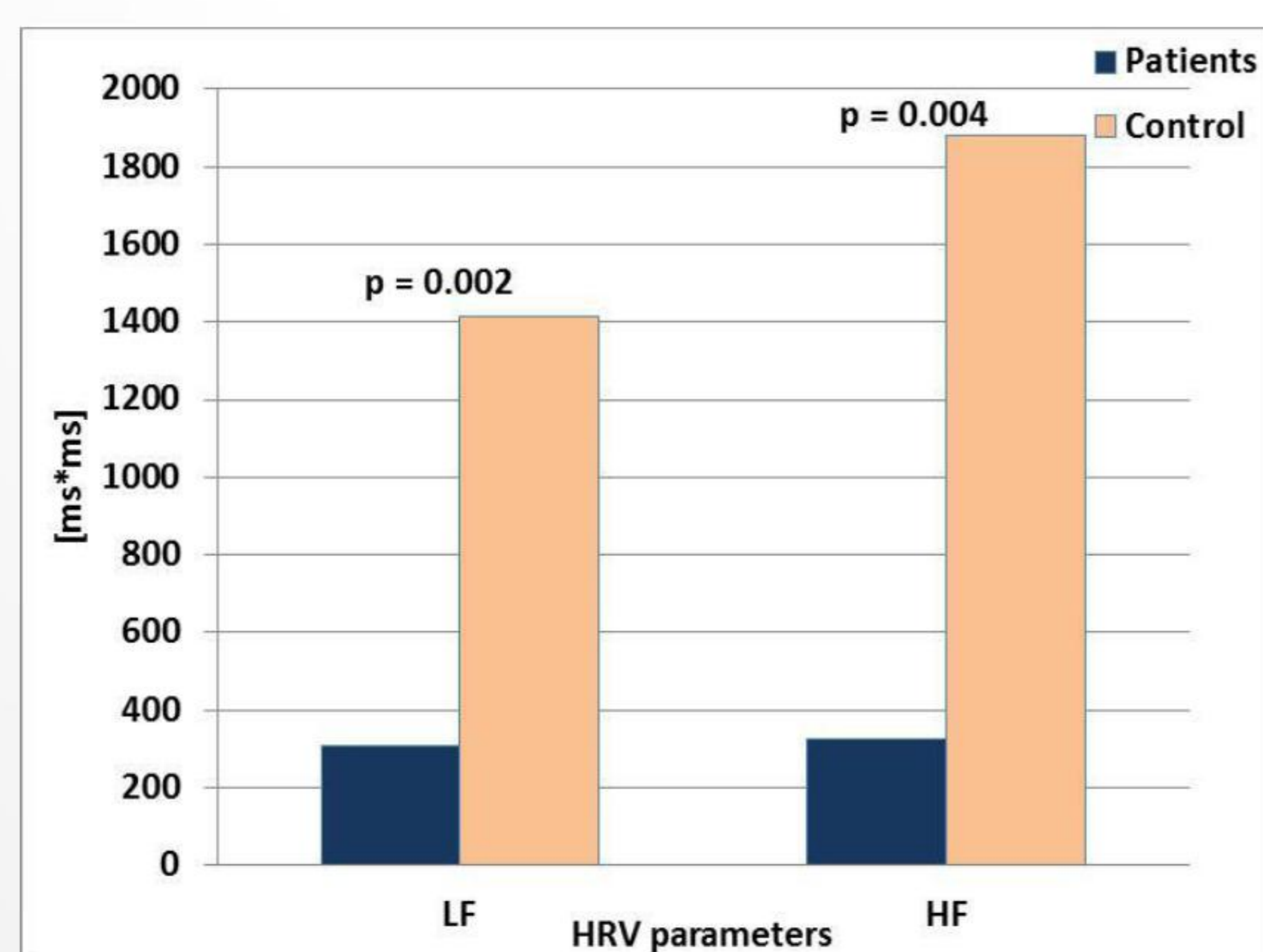


Figure 1 and Figure 2 The differences between HRV parameters in cancer patients and control

Conclusions: Gastric and colorectal cancer affects autonomic system activity. In these patients the sympathetic-parasympathetic imbalance is disturbed with sympathetic overactivity. The changes of autonomic system activity induced by neoplastic processes can due motility dysfunction in GI tract.

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