Daily monitoring of blood pressure in patient with arterial hypertension and comorbid chronic gastritis

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Abstract

The morbidity on the arterial hypertension has the tendency to the increaseduring the last years. The cases of the comorbid motion of the Ŕh are more often register, that undoubtedly, changes a specific to the clinical presentation of the motion of the illnesses. Having regard to contradictory data in relation between the influence of the Helicobacter of pylori (H. pylori) and the chronic gastritis, 71 patients with the comorbid motion of the arterial hypertension and the chronic gastritiswere inspected by us. All the patients have had a breath testwith the aim of diagnostics of the H.pylori. We have also determined such markers of the cardiovascular like: the risc, the body mass index, the Waist – hip ratio, the abdominal obesityfor the study of the influence of the comorbid pathology on the motion of the arterial hypertension including the ambulatory blood pressing monitoring. Among 37 patients with the H.pylori 52, 11% appeared positive (with middle age 54.2 ± 11.5). It was found the increase of index of the body weight on 16.7% that made 32.80 ± 4.10 kg/m^2 in the positive cases H. pylori patients in comparing to the H. pylori negative. The abdominal of the obesity is met substantially more often among patients with the Helicobacter infection.

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The comparison of the results of the monitoring of the daily blood pressing of the patients of the sub-groups found out the substantial difference between the indexes of the night Systolic blood pressure – 143.87 ± 7.75 in a counterbalance 114.39 ± 12.31 ($p<0.05$). There were mainly the violations of the systolic blood pressure among the patients with the H. pylori positive, the nondippers – 47.83% and the night pickers – 7.54%, while on the profile of the diastolic blood pressure the basic part of the patients there were the overdippers – 36.52% and the nondippers – 31.61%, but it was also found out 7.24% patients with the profile of the night peacker. Presence of the H.pylori for the patients with the comorbid motion associated with the violation of the daily blood pressing, by the presence of the abdominal obesity and to the increased of body weight.

Introduction

The interest of the study of extragastric manifestations of helicobacter infection is increasing every year, especially the effects of H. pylori on cardiovascular diseases. Theory of extragastric influences and precisely the relationship between H. pylori and cardiovascular diseases was proposed in 1994, when M. Mendall noted a high prevalence of H. pylori in patients with documented coronary heart disease compared with the control group of almost healthy individuals [1]. This message initiated the interest not only to epidemiological studies of spreading of helicobacter infection, but also the interest to investigate the mechanism of its systemic effects. Clinical symptoms of chronic gastritis often manifest by asthenic neurotic syndrome, which is characterized by general fatigue, irritability, sleep disturbances, cardiac complaints, such as pain in the heart and blood pressure lability. Today, there are hypotheses about the possible impact of H. pylori on the progression of arterial hypertension. R. Harvey worked on this issue. He has found that H. pylori positive patients had higher systolic blood pressure (SBP) before its eradication, particularly in males, but the difference was not reliable and the differences in numbers of diastolic blood pressure (DBP) were not detected [2]. To our mind, the absence of changes in SBP and DBP in patients does not reflect the complete picture of the impact of helicobacter infection, as not only the blood pressure values is the evidence of hypertension but also changes in daily blood pressure profile.

Objectives

To study the changes in daily blood pressure profile and features of hypertension in conditions of comorbidity with chronic gastritis depending on the presence of H. pylori.

Material and methods

In this study were examined 71 patient with combined arterial hypertension and chronic gastritis. Criteria for inclusion were the next: diagnosis of chronic gastritis, presence of hypertension, voluntary written consent of the patient to participate in the study; exclusion criteria were the next: the research didn't involved patients with severe cardiovascular failure, the third stage of hypertension. In order to characterize patients by the presence of H. pylori, patients were divided into groups: I group – patients with comorbid arterial hypertension and H. pylori positive chronic gastritis, II – patients with comorbid pathology H. pylori negative. For all patients anthropometric study was conducted (height, weight index, waist perimeter, waist/hip). Normal perimeter of waist in men was considered less than 94 cm, in women less than 80 cm [3]. Abdominal obesity was determined by measuring tape at the navel and comparing the value obtained with normal values for men which are <102 cm and <88 cm in women [4]. With the ratio of waist and hip contours the index waist hip (WHR) was calculated. The stratification of cardiovascular

risk considering WHR values was performed by followed criteria: low risk – WHR 0,8 and less for women and 0,95 for men, average risk – 0,8-0,85 and 0,96-1,0 for women and for men, high – more than 0.85 for women and more than 1,0 for men. To determine the BI calculations were performed by A. Kettle formula: BMI = weight (kg)/height $(m)^2$. Determination of H. pylori was performed by test kit Heliktest, specificity of which is >95% [5]. The method is based on determination of ammonia in exhaled air before and after taking ^{13}urea (500 mg.). Before undergoing the diagnostic tests for H. pylori patients were not taking proton pump inhibitors within 2 weeks [6]. Daily blood pressure monitoring was performed using the apparatus 41-2 JSC (Ukraine, ICS-Tech). Daily monitoring of blood pressure (DMBP) was performed within 24 hours. In the active period (7:00–22:00) the measurements were carried out every 15 minutes, in the passive period (22:00–07:00) – every 30 minutes. The daily number of blood pressure measurements in every patient was at least 50. Disorders of target organs in patients with hypertension correlated with the average daily level or pressure more than with his one-time measurements. When analyzing DMBP the attention was paid to the study of average systolic blood pressure SBP and diastolic blood pressure DBP and time index (percentage of measurements in which the blood pressure exceeded normal values), the area index (under the curve of the daily schedule), the daily index reflecting night decrease of the blood pressure relative to average daily value. Normal daily blood pressure is characterized by higher values in the afternoon and decreased values at night period. Usually the insufficient night decrease of blood pressure is the early marker of stroke and myocardial infarction in patients with hypertension.

Results and Discussion

As it is known, the age is considered to be not correctable risk factors for arterial hypertension. Our group was representative by age and gender. The age of patients ranged from 18-74 years, almost half of the surveyed patients were in the age group 45-59 years (46%), including average age in the I group was 54,2 ± 11,5 years and in the second 55,67 ± 10,57 years, the proportion of males was 40.85%, females – 59.15%.

The analysis of duration of arterial hypertension and age of the diagnosed patients for the first time, showed that the comorbid conditions were more significant in younger patients, confirming the necessity to find out new markers of early development of comorbidity.

The average duration of hypertension was significantly different between the groups ($p<0.01$), in the first subgroup was 7.94 ± 4.00 years, while in the II group – 4.74 ± 2.68 years ($p<0.05$). During analysis of the history of the disease next risk factors were taken into account for hypertension, recognized by European association of cardiologists: age, heredity, caloric intake, lack of exercise, etc. [7]. Significant differences regarding inheritance factors in two groups and subgroups were not found, the level of inheritance risk factors regarding cardiovascular disease was quite high (76%) in all surveyed patients. The majority of the patients noted a headache (45.39%), increased heartbeat (38.07%), discomfort in the heart area (51.33%), general fatigue (80.18%), dizziness (32.45%), dyspnea (16.93). In part of the patients (17%) arterial hypertension manifests only by isolated increase systolic blood pressure, absence of complaints and usually was found in patients with negative helicobacter. Auscultation has shown the accent of the II tone on the aorta listened in 79% of patients in the 1 group, in 17% was found weakening of the auscultation tone on the cardiac apex, systolic murmur on the aorta was found in 36% of patients. Usually, in the majority of the patients was detected rhythmic, with good filling and voltage pulse with a frequency of 65-100 beats per minute (the average frequency was 76 ± 7.31 beats per minute), a statistically significant difference between I and II groups was 76 ± 8.46 vs 76 ± 6.57 beats/min $p> 0.05$). In 55% of patients during palpation was revealed diffuse cardiac impulse, in 38% cardiac impulse was removed out from the medioclavicular line. During the physical examination measuring of waist and hips contour was performed (tab. 1).

Table 1.
Markers of cardiovascular risk (BI, WHR, abdominal obesity and office blood pressure)

Parameter	I group	II group	p
IMT (kg/m2)	32.80±4.10	27.29±3.27	>0.05
Wrist/hip ratio (WHR):			
Woman	0.85±0.07	0.81±0.02	>0.05
Man	0.99±0.05	0.94±0.03	<0.05
Abdominal obesity, cm			
Woman	96.40± 8.36	88.14±6.49	<0.05
Man	105.00±6.93	98.24±10.23	>0.05
Systolic blood pressure, mm. Hg.	165.00±10.65	155.00±6.92	<0.05
Diastolic blood pressure, mm. Hg.	90.00±11.63	80.00±6.94	>0.05

Assessment of the body mass index allowed to characterize the group as the patients with first degree of obesity (78.4% vs. 17%, p<0.05), while overweight was detected in 20.47% against 69.7% (p<0.05). Our results showed that H. pylori is often found in obese patients, corresponding to the literature [146]. The value of the index waist/hip in women in both groups can attribute them to the group with average cardiovascular risk, and men – to the one with high. In men the contour of the waist in 82.0% compared to 39,81% (p<0.05) cases exceeded normal values, which served as an additional risk factor for cardiovascular disease. In women, abdominal obesity was detected in 67.3% compared to 53,28% (p>0.05) cases in II group.

Differences in the office systolic blood pressure was (165.00 ± 10.65 vs 155 ± 6.92, p> 0.05) and diastolic blood pressure (90.00 ± 11.63 vs 80.00 ± 6.94, p>0.05) in patients of I and II subgroups which was not significant.

During the analysis of the ECG signs the left ventricular hypertrophy was found in 48% of patients, the frequency changes (tachycardia, bradycardia) – in 29%, conduction abnormalities (incomplete blockade of the right and left His' bundle) were detected in 7% of patients. In addition, in order to find out electrocadiographic criteria for the left ventricular hypertrophy the calculation of Sokolov-Lajon and Cornel indexes was performed (Tab. 2).

No significant differences in the presence of electrocardiographic signs of left ventricular hypertrophy in patients of two groups were found.

There was daily evaluation of blood pressure monitoring in all patients. When the performance of daily monitoring of blood pressure in group I and II was performed no significant differences in average values of systolic blood pressure and diastolic blood pressure were detected. (Tab. 3).

Comparing the results of the daily monitoring of blood pressure in patients in I and II groups was revealed a significant difference between the performance of the night systolic blood pressure – 143.87 ± 7.75 opposed to 114.39 ± 12.31 (p <0.05). In other indicators significant differences were not found.

Also in the first group of the patients significantly more patients with insufficient decrease of the night pressure were detected (non-dipper 49.52% against 33.61%) and even with an increased blood pressure during the night (night-peaker 7.56% vs 0%), which may indicate pressure overload and increased risk of hypertension complications. Among the patients in the I group mostly the disturbance of profile of systolic blood pressure was found (nondipper 47.83%

Table 2.
Left ventricular hypertrophy indexes

Index	I group	II group	p
Index of Sokolov Lajon (SV1 +RV5/RV6)	39.4 ± 4.6	36.9 ± 1.1	>0.05
Cornel index (Ravl + SV3)			
Woman	20.81 ± 0.27	19.56 ± 2.1	>0.05
Man	29.52 ± 1.6	27.45 ± 3.5	>0.05

Table 3.
Daily blood pressing monitoring in I and II group of patient

Parameter, mm. Hg.	I group	II group	p
SBP (24)	171.62±10.28	164.24±12.76	>0.05
DBP (24)	99.96±11.18	80.26±6.25	>0.05
SBP(day)	178.66±8.7	167.64±12.69	>0.05
DBP (day)	92.87±7.41	92.61±11.27	>0.05
SBP (night)	143.87±7.75	114.39±12.31	<0.05
DBP (night)	70.65±7.85	66.97±10.85	>0.05

and night picker 7.54%), while profile of diastolic blood pressure in the majority of the patients was of the type of overdipper (36.52%), nondippers (31.61 %) were found in 7.24% and patients with the profile of night peackers, such disorders of blood pressure are prognostic unfavorable risk factor for complications of hypertension.

Analysis of the daily monitoring of the blood pressure showed that patients in group II compared with group I had significant variability in systolic blood pressure as well as diastolic blood pressure, in both groups the index of night time systolic blood pressure differed significantly (72.34 ± 2.5 vs 41.43 ± 5.38, p <0.05), as well as the index of night time diastolic blood pressure (58.64 ± 4.68 to 17.77 ± 6.42) and the area index of night systolic blood pressure (542.70 ± 20.36 to 391.95 ± 17.01, p <0.05).

For an integrated evaluation of the factors influencing the daily blood pressure, a correlation analysis of indicators of cardiovascular risk factors such as standard body mass index, index waist / hip and abdominal obesity was conducted. In patients of the I group daily systolic blood pressure correlated with body mass index (r = 0.83, p <0.05) and abdominal obesity (r = 0.82, p <0.05), time index of systolic blood pressure correlated with body mass index (r = 0.62, p <0.05) and abdominal obesity (r = 0.72, p <0.05), area index of systolic blood pressure correlated with waist / hip index (r = 0.58, p <0.05) and abdominal obesity (r = 0.51, p <0.05), time index of diastolic blood pressure with a body mass index (r = 0.63, p <0.05). In the group II a significant correlation between systolic blood pressure and body mass index (r = 0.65, p <0.05) was found.

Results of the study showed that H. pylori positive patients often have factors of cardiovascular risk, such as increased body mass index and abdominal obesity.

Deviation in daily blood pressure which was established in H. pylori positive patients has show other

than gastric signs of helicobacter infection. In recent years, there is growing evidence of H. pylori relationship with coronary heart disease, hypertension, Raynaud's disease, migraine, chronic urticaria, asthma, etc. [6,7]. At the XXVII International working meeting of the European group studying H. pylori, which was held in Rome in 2014, it was stated that H. pylori is associated with high levels of interleukin-6 and B-type natriuretic peptide and CagA-positive strains may affect the progress of coronary heart disease, especially in its comorbidity with hypertension.

Conclusion

In patients with comorbid course of arterial hypertension and chronic gastritis the presence of H. pylori is an unfavorable factor in the course of diseases, these patients are more likely to have the disorders of the daily monitoring of blood pressure. The formation of pathological daily blood pressure profile in patients with arterial hypertension and H. pylori associated gastritis are caused by increased body mass index, abdominal obesity and the presence of H. pylori. In the future, further more detailed studies of pathogenic effects and extragastric manifestations of H. pylori are essential.

References

1. Mendall MA, Goggin PM, Molineaux N, et al. Relation of Helicobacter pylori infection and coronary heart disease. Br Heart J 1994; 71(5):437-9.
2. Harvey R, Lane A, Murray L, et al. Effect of Helicobacter pylori infection on blood pressure: a community based cross sectional study. BMJ 2001; 323(7307): 264-265.
3. Bum Ju Lee, Young Ju Jeon, Boncho Ku et al. Association of hypertension with physical factors of wrist pulse waves using a computational approach: a pilot study. BMJ 2015; 15: 222.
4. Huimin Fan, Xiaolin Li, Liang Zheng et al. Abdominal obesity is strongly associated with Cardiovascular Disease and its Risk Factors in Elderly and very Elderly Community-dwelling Chinese. Sci Rep 2016; 6: 21521.
5. Pavlova NI, Kornienko EA, Dmytrenko MA, et al. Comparison of non-invasive methods for the diagnosis of Helicobacter pylori. Experience in the use of the respiratory Helik – apparatus in children. Medline Express 2007; 6: 58-59.
6. Zagari RM, Romano M, Ojetti V, et al. Guidelines for the management of Helicobacter pylori infection in Italy: The III Working Group Consensus Report 2015. Dig. Liver Dis 2015; 3: 378-383.
7. Hypertension. The clinical management of primary hypertension in adults. Clinical guideline: Methods, evidence, and recommendations/National Institute for Health and Clinical Excellence. UK: Springer Healthcare, 2011: 127.