Biological Markers and Guided Therapy, Vol. 5, 2018, no. 1, 17 - 24
HIKARI Ltd, www.m-hikari.com
https://doi.org/10.12988/bmgt.2018.823

The Interrelation between Level of Depression and Vital Exhaustion in Hypertensive Patients

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Article

The article presents the results of a study on the assessment of the prevalence of depression and vital exhaustion in patients with stage II hypertensive disease, living on the Donbass territory. According to examination with the Beck Depression Inventory of 1328 patients, depression of more than 20 points was identified in 15 (1.1±0.8%) patients (patients were referred for psychiatrist counseling), and depression of situational or neurotic genesis (10-19 points) – in 216 (16.3±0.3%) patients. All patients with situational depression demonstrated a moderate vital exhaustion according to Maastricht Questionnaire. A strong linear positive correlation between the levels of depression, vital exhaustion and also the indices of systolic and diastolic blood pressure was revealed.

Keywords: arterial hypertension disease, depression, vital exhaustion, blood pressure

Introduction

Arterial hypertension (AH) largely determines the structure of cardiovascular (CV) morbidity and mortality [1]. According to epidemiological studies, the prevalence of AH among adults in developed countries ranges from 30 to 40%; in the group of persons older than 65 years this indicator reaches 50-65% [1, 2]. Current prevalence of AH in the Donetsk region was 44.7% [3].

In 90% and more of all cases, AH is defined as the primary hypertension, the treatment of which bases on several classes of antihypertensive drugs. General practitioners (GPs) prefer ACE inhibitors, angiotensin-II receptor blockers and calcium channel blockers, while other classes of drugs can be prescribed too. At the same time, the GPs do not use therapy, which affects the psychoemotional area of the patient [1, 2, 4].

Currently, depression is seen as an independent CV risk factor [5]. Numerous authors emphasized the influence of chronic psychological and emotional stress on the formation of endothelial dysfunction and the processes of vascular remodeling [5, 6]. There is large body of evidence that the endothelial dysfunction is one of the most important mechanisms of nature evolution of hypertension [5, 6, 7]. In this context, the use of nebivolol, a selective beta1-adrenoceptor blocker (beta1-AB), which restores one of the most important functions of the vascular endothelium, the formation of nitric oxide (NO), which provides vascular relaxation and lowering of blood pressure (BP), is very valuable. Additionally, eliminating the excessive simpatico-adrenal activity on the cardiovascular system beta-AB might have a number of restrictions to the application and they cannot be unconditionally assigned to all patients with hypertension without compelling indications [6].

Thus, the stress remains a trigger of hypertension. Consequently, importance is the study is uncertainty of data regarding that weak stress response to environmental stimuli could leads to a life of exhaustion and worse hypertension [8]. This is especially relevant for patients with GB who are under conditions of chronic psychological and emotional stress caused by the civil conflict in the Donbass region [3]. The aim of the study was to investigate the depression and life exhaustion in hypertensive patients living in the territory of Donbass in the context of ongoing civil conflict.

Methods

It was enrolled 1328 hypertensive patients (mild-to-moderate hypertension with second stage) aged 45-65 years who gave voluntarily agreement to participate. The sample study population allows to reveal 3% of differences in the frequencies of the analyzed indicators (at 95% of the power of the study and 1% level of significance).The study had two periods, e.g. screening and observation. At the screening period the level of depression (screening I) and life exhaustion (screening II) in hypertensive patients living in the Donbass territory were assayed.

Staging and severity of hypertension have determined according to current clinical statement [4]. The 12-leads electrocardiography (ECG), echocardiography (Echo-CG) and consultation of an ophthalmologist were performed. The none-inclusion criteria of the study were stage I and III of hypertension, severe concomitant diseases, liver insufficiency, and chronic kidney disease at moderate-to-severe stages, diabetes mellitus, severe thyroid disorders, thrombophlebitis, alcohol abuse or any drug dependence.

Ethical declaration

All patients included in the study gave their informed consent to participate. The study was confirmed with Local Ethical committee of the Donetsk National Medical University.

Blood Pressure evaluation

During the initial visit of patients with GB, the initial office values of systolic (SBP) and diastolic (DBP) blood pressure were established. Office BP was measured by an indirect auscultation method with the help of a mercury sphygmomanometer ("Ramed", Holland). The measurement of both SBP and DBP was carried out three times at intervals of 2-3 minutes. All patients received previously prescribed antihypertensive therapy, which was analyzed by GP; recommendations are given on the correct intake of drugs, as well as diet and lifestyle modifications were discussed too.

Depression and Vital Exhaustion determination

The presence and level of depression was assessed with the Beck scale, which contains 21 groups of four statements in average from 0 to 3 units [8]. The patient was able to choose one correct statement that accurately reflects its state of health, the way of thinking or mood for last week before visit. If the patient believed that several statements seem to equally fair, the notes were done additionally. When interpreting the results, the total indicator is taken into account; the number of the selected approval corresponds to the number of points for a given answer. According to the Beck scale, the diagnosis of depression was provided at a total score of more than 20 points. The result of less than 10 points indicates the absence of depressive tendencies and being of a good emotional state of the patient [8]. According to the design of the study, similar patients were not included in the study. The result average from 10 to 19 points indicates mild depression of situational or neurotic genesis. Patients who demonstrated mild depression level were asked to undergo testing for Vital Exhaustion examination with Maastricht Questionnaire (MQ) [9, 10].

Statistics

The results of the studies were processed with MedCalc Statistics using the parametric and nonparametric statistics. To represent the results, the mean arithmetic mean (M) and the mean (m) error are given. In the case of qualitative features, the frequency of manifestation (%) and its standard error (m%) were calculated. To determine the dynamics of the change in indicators, the comparison criterion for related samples was used the pair Student's test (in the case of the normal distribution). The Pearson correlation coefficient r was determined [11]. The variance analysis was carried out in the ANOVA software package. Differences between the groups of the obtained data were considered statistically significant at $p \leq 0.05$ and highly significant at $p < 0.001$. The differences are considered to be statistically insignificant in $p > 0.05$ [11].

Results

At the stage of screening I and II hypertensive patients with stage II was carried out at the health facility in Donetsk region from September 2016 to September 2017. All patients have been demonstrating mild depression of situational or neurotic genesis, as well as life exhaustion. Thus, hypertensive patients were enrolled in the conditions of chronic psychological and emotional stress caused by the military conflict in the Donbass during 2.5-3.5 years.

The Beck scale testing (screening I) was proposed to 1328 patients with confirmed diagnosis of stage II of essential hypertension (age: 45-65 years; 677 men). Out of the total number of patients, 15 (1.1%) demonstrated the Beck scale score of more than 20 points (Table 2). These patients were recommended to consult a psychiatrist. In 1097 (82.6 ± 0.1%) hypertensive patients the depressive tendencies were not evident because the level of depression for the Beck scale was less than 10 points (Table 1). Patients who demonstrated a depression level of less than 10 points, and 20 points and more points were not included in screening II.

Two hundred sixteen (16.3 ± 0.3%) patients who underwent examination at screening I period showed a depression level based on the Beck scale score from 10 to 19 points; of which 119 (55.1%) were men and 97 (44.9%) were women. The mean age of men was 55.2 ± 0.8 years, and age of women was 55.4 ± 0.9 years.

Table 1
Distribution of patients with stage II essential hypertension by age and sex depending on the level of depression on the Beck scale

Depression level on the Beck scale	Parameters						
	Mean age, years, $\overline{X}$ ±m	Minimal age, years	Maximal age, years	Men		Female	
				n	P±m (%)	n.	P±m (%)
<10 points (n=1097)	52.4±0.7	43	70	552	50.3±1.2	545	49.7±1.1
10 to 19 points (n=216)	55.3±0.9	45	65	119	55.1±3.2	97	44.9±3.1
>20 points (n=15)	57.3±1.1	54	60	6	40.0±4.8	9	60.0±4.9

All 216 patients who underwent screening I showed a depletion of life in MQ, i.e. these patients underwent screening stage II, which determined the possibility

of their participation in a further research program. The average level of life exhaustion in the patients' population was more than 20 points (Table 2), which corresponds to 62% and is estimated as "life exhaustion average ".

Table 2
The hemodynamics, depression levels and life exhaustion in patients with stage II essential hypertension, $\overline{X} \pm m$

Men (n=119)	Female (n=97)
Office SBP (mm Hg)	
147.9±0.90	147.3±0.72
Office DBP (mm Hg)	
93.6±0.40	93.0±0.40
The level of depression, units	
15.2±0.34	14.9±0.37
The life exhaustion average	
26.6±0.39	26.2±0.37

Results of evaluation of the level of hypertension in patients screened II indicate that the parameters of SBP of patients at a primary examination of the physician are 6.2 ± 0.3% higher than the norm for SBP (139 mm Hg); the DBP of the patients of both groups was 4.8 ± 0.2% higher than the norm for DBP (89 mmHg).

In the course of the correlation analysis, a linear positive correlation between the vital depletion of patients with GB and their depression level (Fig. 1), as well as the levels of SBP, DBP, and depression level ($r > 0.7$; $p < 0.001$) was revealed (Fig. 3).

Thus, the results of the study demonstrated that the prevalence of depression in patients with stage II GB who live in the context of civil conflict in the Donbass region was 17.4 ± 0.3%; in most patients an easy level of depression of situational or neurotic genesis was determined, which also demonstrate " life exhaustion average ". The correlations between the severities of depression, levels of life exhaustion, SBP and DBP were found.

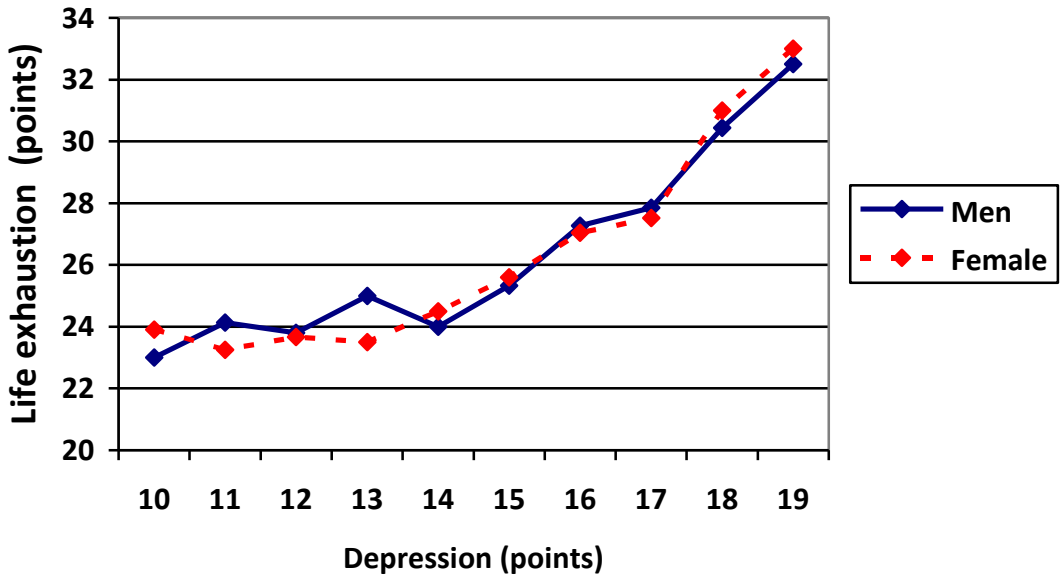

Figure 1: The relations between the life exhaustion (points) and the level of depression (the Beck scale scores) in patients with stage II essential hypertension.

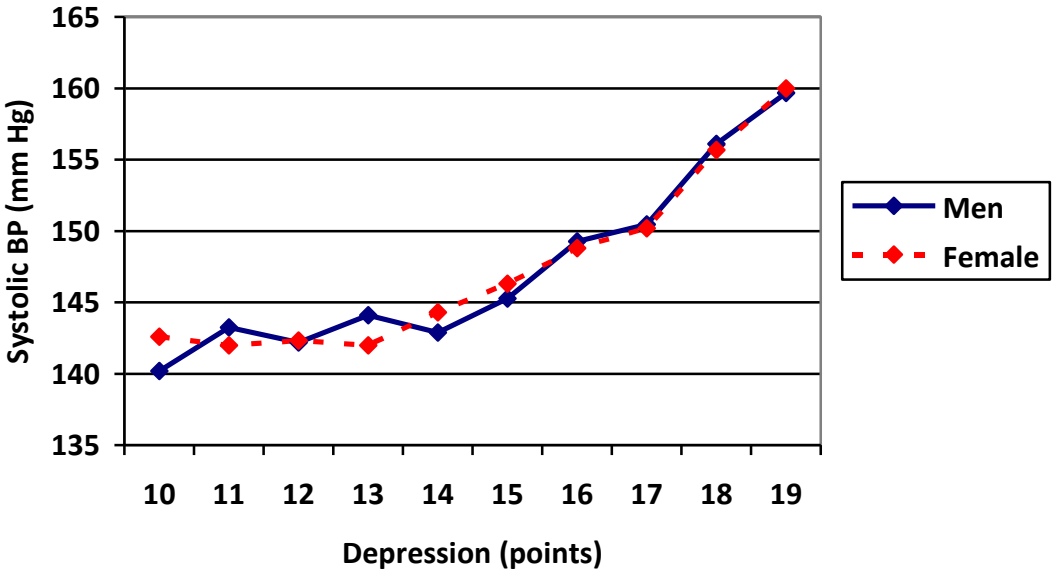

Figure 2: The relation between SBP (mm Hg) and depression levels (points) in patients with stage II essential hypertension

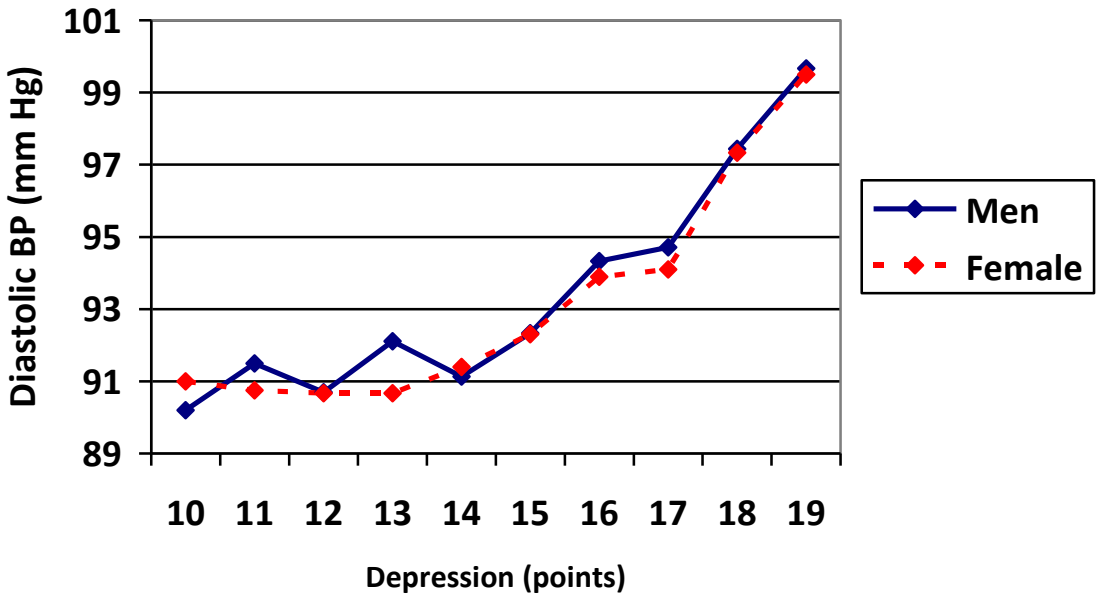

Figure 3: The relation between DBP (mm Hg) and depression levels (points) in patients with stage II essential hypertension

In conclusion, in this study we received a strong relation between the levels of depression, vital exhaustion and both SBP and DBP in individuals with stage II essential hypertension living in the Donbass region that deserves to be taken into consideration when optimal antihypertensive drugs prescribed.

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Received: February 15, 2018; Published: February 27, 2018