

Prevalence of depression in patients with hypertension

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Abstract

Introduction: Hypertension and depression are among the group of the most common chronic diseases worldwide, and according to numerous studies they are oftentimes associated.

Objective and endpoint: To examine the prevalence of depression in patients with hypertension in patients registered in a team of family medicine in the Health Centre Banja Luka, to examine the effects of gender, duration of hypertension and other factors on the incidence of depression in these patients.

Methods: The survey was conducted in the period from 01 July to 31 August 2016, using a questionnaire and data obtained from medical records of patients. The study included patients treated for hypertension, and they were screened from a manual registry of patients with chronic diseases. Depression level was evaluated using Beck Depression Inventory. Data on age, sex, duration of disease, administrated medications, comorbidities and habits were obtained from the medical records of patients.

Results: The study included 200 patients, 79 (39.5%) males and 121 (60.5%) females, 70 (35.0%) patients were ≤ 65 years and 130 (65.0%) > 65 years. Most patients - 109 (54.5%) have been treated for hypertension < 10 years, current smokers were 31 (15.5%) and 60 patients (30.0%) were obese with $BMI \geq 30.0$ kg/m². Out of 200 patients, 108 (54.0%) did not have depression, mild depression was found in 58 (29.0%), moderate depression in 21 (10.5%), and severe depression in 13 (6.5%) patients. The symptoms of depression were statistically significantly ($P < 0.000$) more severe in female patients, and depression was statistically significantly ($P < 0.002$) more expressed in patients with prolonged disease.

Conclusion: The survey showed that some degree of depression was present in almost half (46.0%) of patients treated for hypertension. The research results show the importance of family doctors in the identification and early detection of patients with depression, and timely treatment of patients.

Keywords: hypertension, depression, family doctor

1. Introduction

Hypertension and depression are among the group of the most common chronic diseases worldwide, and according to numerous studies they are oftentimes associated. Patients with chronic illnesses, such as e.g. hypertension, may experience negative emotions that in these patients increase the risk of mental disorders, most commonly depression and anxiety disorders [1, 2].

According to a survey by the World Health Organization (WHO), conducted in 17 countries, for every 20 people one person had a depressive episode in the past. It is assumed that depression affects about 350 million persons worldwide [3]. It is estimated that worldwide one in four adults has hypertension, and it is anticipated that the rising prevalence by 2025 is to result with every third adult with hypertension [4]. Many people with diagnosed hypertension have somatic complaints, poor quality of life and disturbances in daily functionality [5]. These factors may cause a psychosocial distress, which increases the risk of developing depression [6]. Observing the pathophysiological mechanism of depression and hypertension, over-reactivity of the sympathetic nervous system is present in both diseases. The influence of genetic factors in developing both diseases has a very important role and can explain the mechanism of the association between

hypertension and depression. The use of antidepressant drugs may affect the control of blood pressure in patients with hypertension, including changes in blood pressure and orthostatic hypotension [7].

Although the results of numerous studies have shown that there is a mutual link between hypertension and depression, there are still scarce data on the overall prevalence of depression in patients with hypertension [8]. To assess the existence of depression self-reports scales are commonly used. The results of these questionnaires are mostly based on the existence of somatic symptoms, which may not always be associated with hypertension [9]. Studies that used an interview with the patient to make a diagnosis of depression showed that one third of hypertensive patients have depression [10].

1.1 Objective and endpoint

The objective of our study was to examine the prevalence of depression in patients with hypertension in patients registered in a team of family medicine at the ECPM clinic in Health Centre Banja Luka, to examine the effects of gender, age, duration of hypertension, associated diseases, number of used drugs, marital status and other factors on the occurrence of depression.

2. Methods

The study was a cross-sectional study, and was conducted in the period from 01 July to 31 August 2016 using a questionnaire and data obtained from medical records of patients. The study included patients registered in one family medicine team at the Health Center Banja Luka who are being treated for hypertension. The study included patients who were selected from a manual registry of patients with chronic diseases. Of the total of 1,717 people registered in a team of the Family Medicine, 424 patients were treated for hypertension, of which 200 patients were surveyed. Patients were randomized using the manual register; every other patient was selected and invited to participate in the study. From a total of 212 invited patients, 200 patients were interviewed. Patients who had been diagnosed with depression, dementia and psychotic disorders were not included in this study. All included patients completed the consent form to participate in the study. The written consent of the director of the health center was obtained for conducting the research. The study was conducted in accordance with the Declaration of Helsinki.

Blood pressure was measured in all patients, using sphygmomanometer. Data on age, sex, duration of disease, administrated medications, comorbidities and habits were obtained from the medical records of patients, and enrolled in socio-demographic questionnaire that was created for

research purposes. Depression level was evaluated using Beck Depression Inventory.

The research results were statistically analysed by the data from the questionnaires entered into the Excel database, and then statistically analysed. The results were analysed using software package SPSS 11.5 on several levels. Data were processed using different statistical tests: descriptive analysis for frequencies and percentages for the review sample and answer for each question individually. T-test was used to compare the average value of two groups. Differences between certain categories of subjects we analysed using Chi-square test, and the correlation between variables was evaluated using Kruskal-Wallis test. Significance level was 0.05.

3. Results

The study included 200 patients with hypertension, 79 (39.5%) were male and 121 (60.5%) were female. Most of the patients, 130 (65.0%) were over 65 years old. Slightly more than half of subjects, 109 (54.5%) have hypertension for less than 10 years, and most patients were non-smokers - 136 (68%). The average age of subjects was 69 years (SD 10.346), and the average duration of disease was 14.29 years (SD = 11.123). Most patients surveyed are not physically active - 161 (80.5%), while 60 patients were obese with a BMI ≥ 30.0 kg/m² (Table 1).

Table 1: The socio-demographic data of subjects

Variable	Frequency (N)	Percent (%)
Gender		
Male	79	39.5
Female	121	60.5
Age		
≤ 65 years	70	35.0
> 65 years	130	65.0
Duration of disease		
<10 years	109	54.5
11–20 years	49	24.5
≥21 years	42	21.0
Smoking habits		
Non-smokers	136	68.0
Former smokers	33	16.5
Current smokers	31	15.5
Level of physical activity		
No physical activity	161	80.5
Occasional physically active	33	16.5
Regular physically active	6	3.0
Marital status		
Unmarried	10	5.0
Married	117	58.5
Divorced	5	2.5
Widower	68	34.0
Number of family members		
Live alone	49	24.5
Two members	79	39.5
Three members	27	13.5
Four and more members	45	22.5
Body mass index (BMI) kg/m ²		
≤ 25.0	55	27.5
25.1 – 29.9	85	42.5
≥ 30.0	60	30.0

All patients were receiving an anti-hypertensive therapy. The results showed that surveyed patients have a well-regulated blood pressure. The average values of systolic blood pressure in treated patients were 135.28 mmHg (SD 16.581), and of diastolic blood pressure were 80.25 mmHg (SD 8.850). Patients included in the study in addition to hypertension had other comorbidities. Thus, 5 (2.5%) patients had diagnosed anxiety disorder, 8 patients (4.0%) had COPD, 3 (1.5%) patients had renal failure, 10 patients (5.0%) had heart failure, 39 patients (19.5%) had diabetes mellitus, 38 patients (18.0%) had hypothyroidism, and 141 patients had other comorbidities (70.0%) (Figure 1).

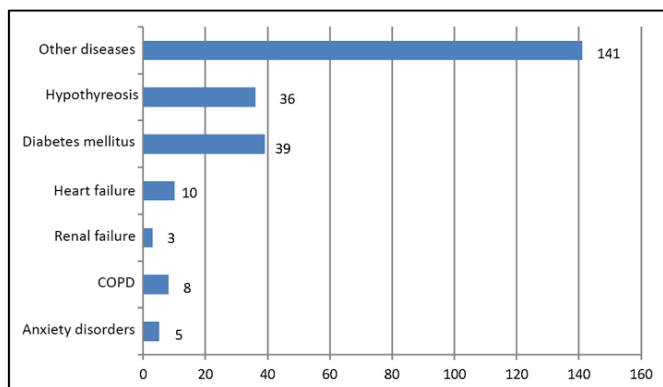


Fig 1: The presence of other diseases in the studied patients

The most commonly used anti-hypertensive drugs in the studied patients are: angiotensin converting enzyme (ACE) Inhibitors in 109 (54.5%), ACE inhibitor + diuretic in 91 (45.5%), beta-blockers in 95 (47.5%) patients, calcium channel blockers in 75 (37.5%), and angiotensin II receptor blockers in 21 (10.5%) patients. In addition to anti-hypertensive therapy patients were using also other medications as a chronic therapy, which the most common used drugs were benzodiazepines in 57 (28.5%) patients and NSAIDs in 59 (29.5%) patients (Figure 2).

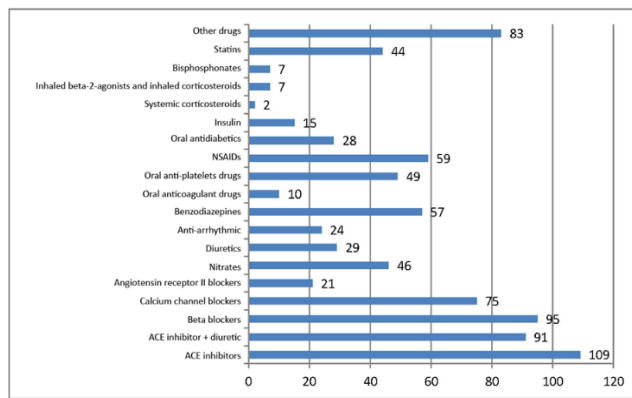


Fig 2: Drugs used as chronic therapy

The largest number of studied patients 108 (54.0%) did not have an evidence of depression according to Beck Depression Inventory; mild symptoms of depression had 58 (29.0%) patients, moderate symptoms of depression had 21 (10.5%), while severe symptoms of depression had 13 (6.5%) surveyed patients) (Figure 3).

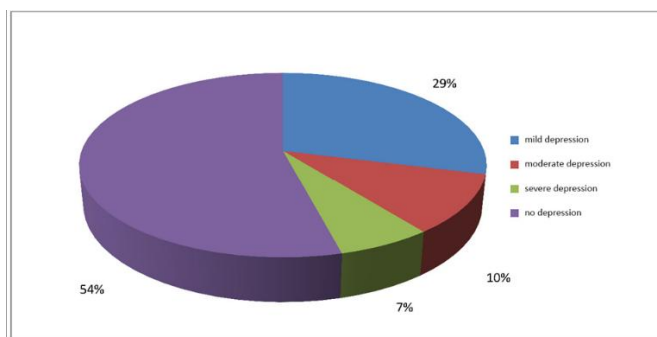


Fig 3: The prevalence of depression in patients with hypertension (Beck's Depression Inventory)

The results showed that female patients had statistically significant ($P = 0.000$) more expressed depression compared to those of male sex (Table 2).

Table 2: The influence of sex on the incidence of depression in patients with hypertension

Category of Depression	Males N (%)	Females N (%)	Pearson Chi-Square	P
No depression	55 (69.6%)	53 (43.8%)	19.563	0.000
Mild depression	21 (26.6%)	37 (30.6%)		
Moderate depression	2 (2.5%)	19 (15.7%)		
Severe depression	1 (1.3%)	12 (9.9%)		

Age of the patient significantly influenced the occurrence of depression in subjects in our study. Thus, the depression was

statistically significant ($P = 0.002$) more expressed in the group of elderly patients aged over 65 years (Table 3).

Table 3: The influence of patient's age on the incidence of depression in patients with hypertension

Category of Depression	≤65 years	>65 years	Pearson Chi-Square	P
No depression	50 (71.4%)	58 (44.6%)	14.797	0.002
Mild depression	15 (21.4%)	43 (33.1%)		
Moderate depression	4 (5.7%)	17 (13.1%)		
Severe depression	1 (1.4%)	12 (9.2%)		

Our research has shown that level of depression became higher with increasing duration of the disease. So the participants with the longest duration of disease for at least 21

years had statistically significant ($P = 0.004$) more pronounced depression than patients with shorter duration of disease (Table 4).

Table 4: The effect of duration of hypertension on the incidence of depression

Category of Depression	≤10 years	11-20 years	≥21 years	Pearson Chi-Square	P
No depression	65 (59.6%)	21 (42.9%)	22 (52.4%)	18.817	0.004
Mild depression	36 (33.0%)	15 (30.6%)	7 (16.7%)		
Moderate depression	4 (3.7%)	8 (16.3%)	9 (21.4%)		
Severe depression	4 (3.7%)	5 (10.2%)	4 (9.5%)		

Marital status of the patient significantly influenced the occurrence of depression in subjects in our study. Widows/widowers had statistically significant ($P = 0.000$) the

most expressed depression in relation to married, divorced and unmarried/single (Table 5).

Table 5: The influence of marital status on the emerging of depression in patients with hypertension

Category of Depression	Unmarried	Married	Divorced	Widower	Pearson Chi-Square	P
No depression	4 (40.0%)	79 (67.5%)	1 (20.0%)	24 (35.3%)	36.351	0.000
Mild depression	2 (20.0%)	31 (26.5%)	3 (60.0%)	22 (32.4%)		
Moderate depression	2 (20.0%)	6 (5.1%)	0 (0.0%)	13 (19.1%)		
Severe depression	2 (20.0%)	1 (0.9%)	1 (20.0%)	9 (13.2%)		

Our research showed that incidence of depression in surveyed patients was statistically significant ($P = 0.024$) higher with

increasing number of drugs included in chronic therapy (Table 6).

Table 6: The impact of the number of used drugs on the incidence of depression in patients with hypertension (*Kruskal – Wallis test*)

Category of Depression	Number of patients	Number of used drugs (Mean)	Standard deviation (SD)	Standard error (SE)	P
No depression	108	3.9907	2.08911	0.20103	0.024
Mild depression	58	4.5517	2.16165	0.28384	
Moderate depression	21	4.8571	2.22004	0.48445	
Severe depression	13	5.1538	2.07550	0.57564	

The results of our study showed that the number of chronic diseases did not affect significantly the occurrence of depression in patients with hypertension ($P = 0.182$). Most of the patients included in our study were physically inactive, and using Pearson Chi- Square test did not reveal any significant difference in the occurrence of depression among physically active and inactive patients ($P = 0.089$). Smoking ($P = 0.365$) or obesity ($P = 0.290$) did not show statistically significant influence on occurrence of depression in patients with hypertension.

4. Discussion

The results of our study showed that 54.0% of surveyed patients, patients with hypertension had no present symptoms of depression measured using Beck's Depression Inventory. Of the 46.0% of subjects who showed symptoms of depression, 29.0% had mild depression, 10.5% had moderate depression, and 6.5% had severe depression. Occurrence of depression was significantly affected by female gender, older age, greater duration of disease, marital status and large number of drugs as chronic treatment. Although most of subjects were insufficiently physically active, a statistically significant effect of physical inactivity on the occurrence of depression in studied patients was not found. The research results have not shown that smoking and the number of chronic diseases significantly affect depression in patients suffering from hypertension.

Results of research conducted by Maatouk and his associates, which included 1,659 patients, demonstrated the association between depression and hypertension in the elderly [11]. Results of this research are complementary with the results of our study in which older patients, aged over 65 years have a

significantly more expressed depression compared to younger subjects.

A large national survey, conducted in South Africa, had on objective to examine association between hypertension, depression and anxiety disorders. The results showed a high prevalence of hypertension and mental disorders in South Africa. However, the study showed a weak association between chronic physical problems and mental disorders [12]. Kretchy and his associates conducted a study in Ghana which included 400 hypertensive patients and had objective to assess the prevalence of anxiety disorders, depression and stress in patients with hypertension. The presence of mental disorders was assessed using DASS questionnaire that consists of 21 questions that assess the presence of a negative emotional state as anxiety, depression and stress. Prevalence of anxiety disorders in this study was 57%, of depression was 4% and moderate or high level of stress were found in 20% of patients [6]. Xue and his associates conducted extensive research on comorbidity between depression and hypertension in adult patients in rural China in the 10,389 patients suffering from hypertension. The results showed that 12.8% subjects showed signs of significant depression. Depression among the examined patients ranged from 5.3% to 32.8% in patients with controlled and uncontrolled hypertension. The study found that prevalence of depression was higher in elderly patients (70 years and over) and patients with uncontrolled hypertension [13]. Prevalence of depression was higher in patients included in our study compared to those in China, but the results of both studies showed that elderly patients suffering from hypertension had depression more commonly present.

Gerontoukou and his associates conducted a study, which included 204 patients, with the objective to investigate the prevalence of anxiety and depression in patients with chronic diseases. The results showed that hypertension was the most common chronic disease associated with anxiety and depression [14]. Hypertension in patients with diagnosed anxiety and depression was followed by other comorbidities, such as hypercholesterolemia and diabetes mellitus.

Large sectional study was conducted in Sweden. The study population included all living persons who resided in Stockholm County, Sweden, on January 1, 2011 (N=2,058,408). The objective of this study was to investigate the prevalence of mental disorders (anxiety disorders, depression, bipolar disorder, schizophrenia) in people with hypertension or without hypertension. The results showed a high prevalence of anxiety and depression in patients with hypertension, suggested the insufficient number of patients with diagnosed hypertension which can cause severe mental disorders. Authors of the study warrant efforts to integrate psychiatric and hypertensive care [15].

Numerous authors conducted researches in order to determine the presence of hypertension in patients with depression. So Dhar and his associates conducted a study in order to examine the incidence of cardiovascular diseases in patients with depression. The results showed that depression and stress were important independent risk factors for cardiovascular diseases. Most common cardiovascular disease in patients with depression was hypertension [16]. A large research was conducted on the relationship between depression and hypertension, which included 9,182 women of middle age, which were followed as long as 15 years, and it showed that hypertension has been in follow-up period developed in 2,738 women diagnosed with depression. The authors concluded that there was a frequent comorbidity between hypertension and depression. Anxiety and depression are among the obvious risk factors of developing hypertension, and because of this further research that would further clarify this association is required [17]. Large sectional study was conducted in India with the objective to investigate comorbidity among diabetes, hypertension, anxiety and insomnia. Study was included 2,276 patients across 18 states in India. This study demonstrates high prevalence of depression among employed and educated adult Indian patients, and hypertension and diabetes are the two most common comorbidities in patients with depression [18].

Results of this study demonstrate a high prevalence of depression in patients with hypertension, a statistically significant effect of female sex, older age, concomitant using a numerous drugs in chronic treatment setting, and marital status on the incidence of depression in patients with hypertension. However, we believe that other factors in Bosnia and Herzegovina have a significant impact on the high percentage of depression in the studied patients. We assume that the situation after the war and poor socio-economic status of the population of Bosnia and Herzegovina to a large extent, except the examined factors contribute to the high prevalence of depression.

5. Conclusion

The survey showed that some degree of depression was present in almost half (46.0%) patients treated for hypertension. The research results show the importance of

family doctors in the identification and early detection of patients with depression, and timely treatment of patients. Special attention in the early detection of depression should be given to patients suffering from chronic diseases, including hypertension, due to the extremely high rates of comorbidity with depression.

6. References

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