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Psychosocial and clinical characteristics of depressive patients with the diagnosis of metabolic syndrome

Marko Martinac[1], Danijel Bevanda[2], Daniela Bevanda-Glibo[2], Ivan Tomić[2], Monika Tomić[2], Milenko Bevanda[1], Ivan Vasilj[1]

[1]University of Mostar, Medical Faculty Mostar

[2]University Hospital Mostar, Internal Medicine Clinic

Abstract – There is a growing quantity of data showing that mental illnesses affect the somatic health. Depression is a complex disease, connected with the disturbances of sleep-cycle, appetite, body weight and level of physical activity, all of which may represent the risk factors for the development of metabolic disturbances. In the depressive patients, there is a number of various physiological mechanisms and psychosocial factors which may influence the development of metabolic syndrome (MS), such as sex, age, smoking, stress levels, nutrition and level of physical activity. It is considered that chronic stress causes depression and the resulting bad life habits may lead to MS and finally KVB. Aim of this study was to investigate the psychosocial and clinical features of depressive patients with the diagnosis of MS. The cross-reference study has been done at the sample of 80 patients diagnosed with MS. Among the diagnostic instruments applied, we have used the structured socio-demographic questionnaire, MINI questionnaire, Hamilton Rating Scale for Depression (HAMD-17) and Clinical Global Impression (CGI). The diagnosis of metabolic syndrome had been established following the NCEP ATP criteria. Among the depressive patients, there were 38.8% who fulfilled the criteria for establishing the diagnosis of MS. There was a greater incidence of suicide among the depressive patients with the diagnosis of MS. The diagnose was more frequently established in depressive women, while an increased intake of carbohydrates represented a significant feature of both depression and MS. Further research is needed to explain the observed gender differences and to determine if the interventions aimed to treating the depression can also contribute to accepting the healthy life habits and as a consequence, indirectly reduce the incidence of MS.

Key words: depression, metabolic syndrome, psychosocial factors

e-mail: alcoholism.kbcsm@gmail.com • www.http//hrcak.srce.hr/acoholism

Correspondence to: Marko Martinac
Centar za mentalno zdravlje Mostar
Hrvatskih branitelja bb, 88 000 Mostar
e-mail: marko.martinac@tel.net.ba

Introduction

More severe mental illnesses, like depression, are connected with various cardiovascular risk factors, like hypertension, obesity, atherogenic dyslipidemia, hyperglycemia, smoking and alcohol and other psychoactive

substances abuse. Patients suffering from the depressive disorder display alterations of circadian rhythm, sleep disturbances, changes of autonomic nervous system, hypothalamus-hypophysis-adrenal gland axis (HHN) hyperactivity and changes of immunologic system. On the other hand, the somatic diseases, like obesity, hyperlipidemia, hypertension and diabetes mellitus type II are lately ever more often accepted as significant comorbid states in patients with more severe mental diseases. There is ever more data showing that the severe mental illnesses also affect the somatic health and only lately, these states are evaluated in the context of metabolic syndrome. Pathogenesis of metabolic syndrome, similar to pathogenesis of depression, is complex and insufficiently investigated. However, it is considered that the interactions of chronic stress, psychological trauma, hypercortisolism and disturbed immunologic functions contribute to the development of these disturbances [1-6].

Metabolic syndrome (MS) is a complex multisystem disturbance, consisting of several components, namely: abdominal obesity, lipid metabolism dysfunction, hypertension and glucose metabolism dysfunction [7]. Besides that, the syndrome is connected with pro-inflammatory and pro-thrombotic state, resulting from the secretory activity of fat tissue, characterized by an increased level of inflammation mediators, endothelial dysfunction, hyperfibrinogenaemia, increased aggregation of thrombocytes, increased concentration of plasminogen activation inhibitors, increased levels of uric acid and microalbuminuria. MS represents the greatest risk for diabetes and cardiovascular diseases. MS was described in patients with polycystic ovaries syndrome, non-alcoholic steatosis of the liver, microalbuminuria and chronic renal failure [7-10].

Depression is a complex disease, connected with alterations of sleep, appetite, body weight and level of physical activity, all of which can represent risk factors for the development of metabolic disturbances. In depressive patients, various physiological mechanisms can influence the development of metabolic syndrome, such as disturbed regulation of HHN axis and noradrenergic system, as well as various psycho-social factors, such as gender, age, smoking, stress levels, nutrition and level of physical activity [11-14]. It is possible that MS represents a connection between depression on one and KVB and diabetes on the other side. It is considered that chronic stress causes depression and consequently harmful lifestyle, which can lead to MS and consequently, development of KVB [15]. Disturbed regulation of HHN axis is typically connected to chronic stress and numerous studies had described such connection between depression and high levels of cortysole [16-18]. On the other hand, increased levels of cortysole are connected with components of metabolic syndrome, such as the abdominal obesity and glucose intolerance, so depression can indirectly influence the metabolism of glucose and the risk of diabetes development [19,20]. Besides that, psycho-social variables, such as depressive mood, can result in changes of levels of pro-inflammatory cytokines, which are also important components for the development of metabolic syndrome [21].

Based on the research so far, we may say that the depressive patients show a greater incidence of cardiovascular diseases, hypertension and diabetes compared to the other psychiatric patients and the general population [22-39]. Symptoms of a depressive disturbance are frequently observed among the patients with MS and fatigue is a frequent

symptom in states with a chronic activation of non-specific immunity, such as MS [39-43].

The aim of this study was to determine the psychosocial and clinical features of depressive patients diagnosed with MS.

Patients and methods

Patients

A cross-sectional study has been done on the sample of 80 patients suffering from depressive disorder. From that total number, 40 of these subjects suffered from the melancholic type of the depressive disorder, while 40 had been classified as a non-melancholic depression. In the investigation were included patients of both genders with no other somatic diseases besides the components of metabolic syndrome and with no other psychiatric diseases but the co-morbid depressive disorder. In the group with depressive patients, there were 46 males and 34 females, mean age 50.03 ± 9.35 years, mean onset of depression at the age of 44.6 ± 9.18 years, mean duration of depression 6.08 ± 4.92 years, mean number of depressive episodes 2.21 ± 1.98 and the average result on HAMD—17 26.6 ± 9.72. Only the patients who had been at least three months off any psychiatric therapy were included in the study. All patients suitable for the study had been presented with the aim and the purpose of investigation and they were asked to sign an informed consent for participation in it. The control group consisted of healthy volunteers of both genders, suffering from no somatic or psychiatric diseases, who had also given an informed consent for the participation in this study. Members of the control group had been recruited from hospital staff and it consisted of 40 subjects, 15 males and 25 females, mean age 45.5 ± 9.37 years, averaging 3.44 ± 2.06 on HAMD-17. Those patients who had not given the informed consent or had been proved to suffer from some other co-morbid psychiatric disturbance, addiction to alcohol or other psychoactive substances or any other somatic disease that does not belong among the components of MS and those who had used the anti-inflammatory medications were not included in the study.

Diagnostic instruments

For the purpose of this study, we have used a structured questionnaire, consisting of socio-demographic and history variables, such as: sex, age, level of education, work status, marital status, place of residence, family heredity of depressive disturbances, age of the onset of the first episode, duration of the disease, total number of episodes of the depressive disorder, smoking, alcohol and feeding habits.

All patients included into he study had been diagnosed with the depressive disorder, i.e. all other psychiatric diagnostic categories had been excluded using MINI questionnaire (Mini International Neuropsychiatric Interview). MINI is a short structured interview, developed in the collaboration of European and the American clinical psychiatrists, tailored after DSM IV and MKB 10 classifications of psychiatric disturbances [44] MINI questionnaire had been used also to determine the type of the depressive disorder (melancholic and non-melancholic).

As an additional diagnostic means in establishing the diagnosis and estimating the severity of the depressive disorder (mild, moderate and severe), Hamilton's evaluation

scale (Hamilton's Rating Scale for Depression HAND-17) had been used. This evaluation scale dates from the 1960 but is still, despite the fifty years of use, the most frequently applied and one of the most popular scales for depression [45].

For the estimation of severity of depressive episodes and the response to treatment, the psychiatric rating scale Clinical Global Impression (CGI) had been used [46].

The diagnosis of metabolic syndrome was established according to NCEP ATP III criteria [47] and they had been chosen because they had been applied in most of the previous investigations. According to that definition, MS was confirmed in patients who satisfied three or more of following criteria:

1. Central obesity (waist circumference > 102 cm in men, > 88 cm in women)
2. Elevated triglycerides (>= 1.7 mmol/L or requiring the fibrates in therapy)
3. High blood pressure (systolic >= 130 or diastolic >= 85 mm of Hg or requiring the pharmaceutical control of hypertension)
4. Increased morning levels of blood sugar (>= 6.11 mmol/L or previously known diagnosis of Type II diabetes)
5. Reduced levels of HDL cholesterol (< 1.04 mmol/L for men, < 1.3 mmol/L for women or requiring the use of fibrates in therapy)

Clinical examination and anthropometric measures

All subjects had their systolic and diastolic blood pressure measured on the forearm, using a mercury sphygmomanometer immediately after 30 minutes of relaxation. Height and weight were measured using a hospital scale, with patients wearing light clothes and with no shoes. The waist circumference was measured using a tailors' measuring meter at the level between the last rib and crista iliaca, on the bare skin, while expiring. All measured have been done three time in a row and then the mean values have been calculated. General medical and neurological examination had been used to exclude other somatic and neurologic diseases.

Statistical analysis

The results obtained have been processed using descriptive, parametric and non-parametric methods, according to the distribution of data. Categorical variables have been shown in descriptive statistics as frequencies and percentages, while the continuous variables have been shown as the arithmetic means and standard deviations. The differences in socio-demographic variables have been determined using Chi-Square Test and Fisher's Exact Test. The differences in clinical characteristics have been determined using Student's T-Test and Chi-Square Test. Determining the intergroup differences in variables of lifestyle has been done using Chi-Square Test. Fisher's Exact Test and Kruskall Wallis test. Distribution of data has been tested using Kolmogorov-Smirnoff Test. Statistically significant levels were set at $p<0.05$.

SPSS statistical software, v. 15 has been used for all statistical analyses (SPSS, Chicago, IL).

Results

Socio-demographic features of the sample

In this study, 28.4% of all subjects had been found to satisfy the NCEP ATP III criteria for MS diagnosis. The depressive patients fulfilled the criteria for MS and all of its components

in significantly greater proportion compared to the control group. 38.8% of depressive subjects had fulfilled the criteria for establishing the diagnosis of MS ($p<0.001$).

The main features of the samples have been shown in Table 1. As he Table shows, the incidence of metabolic syndrome was significantly higher among women. There were no significant inter-group differences considering their age, level of education, work and marital status, place of residence, smoking, alcohol drinking and alimentary habits.

Table 1 Socio-demographic characteristics of patients suffering from the depressive disorder with and without metabolic syndrome.

Variable	Diagnosis of metabolic syndrome		p
	No	Yes	
Age (X±SD)	49.43±8.34	50.97±10.84	0.477†
Sex N (%)			0.045‡
M	33 (67.3)	13 (41.9)	
Ž	16 (32.7)	18 (58.1)	
Level of education N (%)			0.750‡
Primary	7 (14.3)	4 (12.9)	
Secondary	31 (63.3)	22 (71)	
University	11 (22.4)	5 (16.1)	
Marriage N (%)			0.093*
Not married	10 (20.4)	3 (9.7)	
Married	35 (71.4)	21 (67.7)	
Divorced	3 (6.1)	2 (6.5)	
Widower	1 (2)	5 (16.1)	
Work N (%)			0.072‡
Unemployed	7 (14.3)	6 (19.4)	
Employed	30 (61.2)	11 (35.5)	
Retired	12 (24.5)	14 (45.2)	
Place of residence N (%)			0.218‡
City	30 (63.8)	13 (46.4)	
Village	17 (36.2)	15 (53.6)	
Smoking N (%)			0.555‡
Not smoking	28 (60.9)	18 (62.1)	
Smoking	17 (37)	9 (31)	
Abstinent	1 (2.2)	2 (6.9)	

Table 1 *(Continued from previous page)*

Variable	Diagnosis of metabolic syndrome		p
	No	Yes	
Alcohol N (%)			0.183*
Does not drink	39 (84.8)	22 (75.9)	
Occasionally	7 (15.2)	5 (17.2)	
Abstinent	0 (0)	2 (6.9)	
Alimentary habits N (%)			0.405‡
<40 % CH	2 (6.1)	0 (0)	
40-60 % CH	21 (63.6)	13 (59.1)	
>60 % CH	10 (30.3)	9 (40.9)	

†Student's t-test; ‡Chi-Square Test; *Fisher's Exact Test

Clinical characteristics of the sample

The subjects with metabolic syndrome showed much higher results on scales of depression and anxiety and a significantly higher number of suicide attempts in history, although there were no significant differences considering the suicide risk estimate (Table 2).

However, when only the depressive patients had been analyzed, the previously observed differences in results of depression and anxiety rating scales and suicide attempts were gone and there were also no differences considering the onset age of depression, duration of depression, number of depressive episodes, suicide risk estimate and results on CGI-S and CGI-C rating scales (Table 3).

Table 2 Clinical characteristics of the sample of patients suffering from the depressive disorder with and without metabolic syndrome.

Variable	Diagnosis of metabolic syndrome		p
	No	Yes	
HAM-D 17 (X±SD)	17.5±14.04	25.3±9.96	0.002[a]
HAM-A (X±SD)	16.16±12.12	22.15±9.98	0.028[a]
Risk of suicide N (%)			0.051[b]
No risk	47 (55.3)	10 (29.4)	
Low	10 (11.8)	6 (17.6)	
Moderate	12 (14.1)	5 (14.7)	
High	16 (18.8)	13 (38.2)	
Suicide attempts (X±SD)	0.19±0.49	0.53±0.89	0.041[a]

[a]Student's T-test; [b]Chi-Square Test

Table 3 Clinical characteristics of patients suffering from the depressive disorder with and without metabolic syndrome.

Variable	Diagnosis of metabolic syndrome		p
	No	Yes	
Age of depression onset (X±SD)	44.2±8.08	45.21±10.75	0.651[a]
Duration of depression (X±SD)	5.55±4.99	6.9±4.78	0.254[a]
Number of episodes (X±SD)	1.89±1.75	2.71±2.24	0.085[a]
HAM-D 17 (X±SD)	27.5±9.58	25.3±9.96	0.334[a]
HAM-A (X±SD)	23.03±11.5	22.15±9.98	0.754[a]
CGI-S (X±SD)	5.24±0.92	5.32±0.86	0.730[a]
CGI-C (X±SD)	2.28±0.75	2.71±0.92	0.140[a]
Suicide risk N (%)			0.773[b]
No risk	10 (20.8)	7 (22.6)	
Low	10 (20.8)	6 (19.4)	
Moderate	12 (25)	5 (16.1)	
High	16 (33.3)	13 (41.9)	
Suicide attempts (X±SD)	0.33±0.62	0.58±0.92	0.184[a]

[a]Student's T-test; [b]Chi-Square Test

Differences in smoking habits, alcohol drinking and carbohydrate percentage in food, depending on the depression-related parameters.

Smoking habits amongst the subjects have been shown in Table 4. The subjects who established the abstinence from smoking have scored much higher on anxiety scales, while there were no significant differences considering the depression and other clinical variables shown.

The alcohol-drinking subjects amongst the subjects depending on depression and anxiety-related parameters have been shown

Table 4 Differences in smoking habits depending on the depression-related parameters.

Variable	Smoking			χ^2	p
	Does not smoke	Smokes	Abstinent		
Type of depression N (%)				1,785	0,447[†]
Melancholy	26 (56.5)	11 (42.3)	1 (33.3)		
Non-melancholy	20 (43.5)	15 (57.7)	2 (66.7)		
Number of episodes (X±SD)	2.32±2.17	2.42±1.79	1±0	3.016	0.221[‡]
Duration of depression (X±SD)	6.14±4.46	6.08±5.53	6±6.93	0.365	0.833[‡]

Table 4 *(Continued from previous page)*

Variable	Smoking			χ^2	p
	Does not smoke	Smokes	Abstinent		
Age of depression onset (X±SD)	45.43±9.78	42.83±7.94	52.67±4.16	4.244	0.120‡
Suicide attempts (X±SD)	0.23±0.48	0.42±0.91	0.33±0.58	0.628	0.731‡
HAMD-17 (X±SD)	18.44±14.08	20.46±12.91	20.67±1.15	0.583	0.747‡
HAMA (X±SD)	15.7±12.03	19.55±10.74	28±5.57	6.598	0.037‡

† Fisher's Exact Test, ‡Kruskal Wallis test

in Table 5. Using the Kruskal-Wallis Test, we have found significant differences between the groups tested in results scored on depression rating scales, while there were no significant differences in other variables shown. To determine the difference between the individual groups, we have used the Kruskal-Wallis Z-Test. We have found a statistically significant difference in the level of depression between the subjects who do not drink alcohol and those who reported to drink occasionally (z= 3.0727).

Alimentary habits depending on depression and anxiety-related parameters have been shown in Table 6. The subjects who had reported a greater percentage of carbohydrates in their food scored significantly higher on depression and anxiety rating scales, while there were no significant differences concerning the other clinical variables.

Table 5 Differences in alcohol drinking depending on depression-related parameters.

Variable	Alcohol			χ^2	p
	Does not drink	Drinks occasionally	Abstinent		
Type of depression N (%)				0.725	0.768†
Melancholy	32 (52.5)	5 (41.7)	1 (50)		
Non-melancholy	29 (47.5)	7 (58.3)	1 (50)		
Number of episodes (X±SD)	2.33±2.18	2±1	3±0	1.703	0.456‡
Duration of depression (X±SD)	6.05±4.96	6.64±5.08	5±0	0.182	0.916‡
Age of depression onset (X±SD)	45±9.1	42.73±9.55	52±8.48	1.729	0.448‡
Suicide attempts (X±SD)	0.27±0.57	0.38±0.87	0±0	0.567	0.753‡
HAMD-17 (X±SD)	21.39±12.66	13.21±14.45	19.5±0.71	9.446	0.005‡
HAMA (X±SD)	18.8±10.68	15.69±13.68	23±0.57	3.668	0.122‡

† Fisher's Exact Test, ‡Kruskal Wallis Test

Table 6 Differences in alimentary habits depending on depression-related parameters.

Variable	Nutrition			χ^2	p
	<40 % CH	40-60 % CH	>60 % CH		
Type of depression N (%)				2.685	0.261†
Melancholy	2 (100)	14 (41.2)	8 (42.1)		
Non-melancholy	0 (0)	20 (58.8)	11 (57.9)		
Number of episodes (X±SD)	5±4.24	2.26±1.69	2.61±2.66	1.571	0.456‡
Duration of depression (X±SD)	12.5±13.43	6.97±5.23	5.56±3.91	1.106	0.575‡
Age of depression onset (X±SD)	40.5±2.12	44±8.69	45.33±10.78	1.202	0.548‡
Suicide attempts (X±SD)	0.08±0.29	0.33±0.73	0.23±0.43	1.395	0.498‡
HAMD-17 (X±SD)	8.17±10.35	19.52±13,47	19.67±11.18	6.935	0.031‡
HAMA (X±SD)	10.58±8.01	22.05±12.05	13.5±9.87	11.333	0.003‡

†Chi-Square Test, ‡Kruskal Wallis Test

To determine the differences between the individual groups, Kruskal-Wallis Z-test had been used. We have found statistically significant differences in depression levels according to HAMD-17, i.e. the patients who had reported <40 % of carbohydrates in their nutrition scored much lower on depression scales compared to the patients with 40-60 % of carbohydrates in nutrition (z=2.594) and to the patients with >60 % of carbohydrates in nutrition (z=2.181). Besides that, we have found a statistically significant difference in anxiety levels according to HAMA scale, i.e. the subjects who had reported <40 % of carbohydrates in their nutrition scored significantly lower on the scale compared to the subjects with 40-60 % of carbohydrates in nutrition (z=3.054), while the subjects with 40-60% of carbohydrates scored much higher on anxiety scale compared to the subjects with >60 % of carbohydrates in their nutrition (z=2.108).

Differences in smoking habits, alcohol drinking and carbohydrate percentage in nutrition depending on MS and its components

The subjects who reported themselves as smokers fulfilled in significantly greater percentage the NCEP ATP-III criteria for hypertriglyceridaemia (p=0.012), while the abstinents showed a significantly larger percentage of hyperglycemia (p=0.05). There were no significant differences neither considering the levels of HDL-cholesterol in serum, nor considering the abdominal obesity, hypertension, number of components and the diagnose of MS (Table 7).

The alcohol-drinking habits amongst the subjects depending on MS and its compo-

Table 7 Differences in smoking habits depending on MS and its components.

Variable N (%)	Smoking			χ^2	p
	Does not smoke	Smokes	Abstinent		
Abdominal obesity	23 (32.4)	14 (36.8)	2 (66.7)	1.868	0.404†
Hypertension	38 (53.5)	16 (42.1)	3 (100)	3.864	0.120†
Hyperglycemia	9 (12.7)	3 (7.9)	2 (66.7)	6.166	0.035†
Hypertriglyceridaemia	27 (38)	25 (65.8)	1 (33.3)	7.918	0.012†
Low HDL	12 (16.9)	11 (28.9)	1 (33.3)	2.836	0.246†
Number of components (X±SD)	1.54±1.21	1.82±1.5	3±1.73	2.996	0.224‡
MS	18 (25.4)	12 (31.6)	2 (66.7)	2.676	0.207†

†Fisher's Exact Test, ‡Kruskal Wallis Test

nents have been shown in Table 8. No significant differences were observed considering the parameters tested.

The subjects who reported a greater percentage of carbohydrates in their nutrition fulfilled the NCEP ATP-III criteria for abdominal obesity ($p<0.011$), hypertension ($p<0.006$) and hypertriglyceridaemia ($p<0.009$) in significantly larger percentage, reported significantly more components of MS ($p<0.001$) and met the criteria for establishing the diagnosis of metabolic syndrome in much greater number ($p=0.033$). There were no significant differences considering the levels of glucose and HDL-cholesterol in serum (Table 9).

Table 8 Differences in alcohol drinking habits depending on MS and its components

Variable N (%)	Alcohol			χ^2	p
	Does not drink	Drinks occasionally	Abstinent		
Abdominal obesity	28 (35.9)	9 (28.1)	2 (100)	3.786	0.115†
Hypertension	40 (51.3)	15 (46.9)	2 (100)	1.783	0.559†
Hyperglycemia	13 (16.7)	1 (3.1)	0 (0)	4.009	0.105†
Hypertriglyceridaemia	38 (48.7)	13 (40.6)	2 (100)	2.480	0.299†
Low HDL	15 (19.2)	9 (28.1)	0 (0)	1.369	0.580†
Number of components (X±SD)	1.72±1.26	1.47±1.52	3±0	3.878	0.144‡
MS	22 (28.2)	8 (25)	2 (100)	4.212	0.139†

†Fisher's Exact Test, ‡Kruskal Wallis Test

Table 9 Differences in alimentary habits depending on MS and its components

Variable N (%)	Nutrition			χ^2	p
	<40 % CH	40-60 % CH	>60 % CH		
Abdominal obesity	2 (16.7)	14 (26.9)	13 (59.1)	8.972	0.011†
Hypertension	2 (16.7)	24 (46.2)	16 (72.7)	10.145	0.006†
Hyperglycemia	1 (8.3)	7 (13.5)	2 (9.1)	0.435	0.805†
Hypertriglyceridaemia	0 (0)	23 (44.2)	11 (50)	9.334	0.009†
Low HDL	0 (0)	11 (21.2)	5 (22.7)	3.213	0.201†
Number of components (X±SD)	0.42±0.67	1.52±1.41	2.14±1.17	15.662	<0.001‡
MetS	0 (0)	13 (25)	9 (40)	6.849	0.033†

†Chi-Square Test, ‡Kruskal Wallis Test

Discussion

In this study, from the total number of subjects tested, we have found 28.4% who satisfy the NCEP ATP III criteria for MS diagnosis. Depressive patients have fulfilled the criteria for the diagnosis of MS and all of its components in significantly greater percentage compared to the control group, i.e. 38.8% of depressive patients met the criteria for establishing the diagnosis of MS.

The depressive subjects in this study were significantly older than the subjects from the control group, they were more often single, unemployed and with a much greater percentage of carbohydrates in their diet. Subjects with MS were of lower level of education, unemployed, with significantly greater percentage of carbohydrates in their diet. Contrary to the similar investigation on hospitably treated subjects, where the patents with MS had been significantly older than the patients without MS [48], there were no such differences observed in our group of subjects. These findings also contradict the studies in which an increased incidence of MS had been found in patients of later ages [7]. Among the depressive patients, females have significantly more frequently fulfilling the criteria for MS, which is in concordance with investigation of correlation of depression and MS on a sample of young adults, which had showed that younger women with at least one depressive episode in their histories had significantly higher probability of developing MS compared to those who had no depressive episodes in their histories [39].

Depressive patients have met the criteria for establishing the diagnosis of MS and all of its components in significantly greater percentage compared to the control group, i.e. 38.8% of depressive patients have fulfilled the criteria for MS diagnosis, which is in concordance with data published by Jakovljević et al. In their review paper in 2007 [1]. Subjects with MS scored much higher on depression and anxiety scales, which is similar as found by other researchers [49] and had a significantly greater number of suicide attempts in their histories, as opposed to the similar investigation on a sample of hospitally-treat-

ed patients, where the group of patients with MS had a significantly lower number of suicides [50]. The same study reported that the group of patients with metabolic syndrome had shorter depressive episodes, while in this study, no significant differences were observed between the patients with and without MS neither considering the age of depression onset, nor duration of depression, number of depressive episodes, suicide risk estimate and CGI-S and CGI-C scales results, which is in concordance with the investigation carried out by Capuron et al. in 2008 [51], which also had not revealed any significant differences between the patients with and without MS considering the history of previous depressive episodes, suggesting that the depressive simptomatology in MS is more related to the immediate medical and metabolic condition than with any pre-morbid characteristics of either the depression or the personality itself [51].

Previous studies have shown that depression can be connected to bad alimentary habits and can be sporadically related to an excessive intake of calories under the influence of psychological distress caused by the depression itself [52-54]. According to the results of this study, the level of depression was connected with greater percentage of carbohydrates in patients' diet. The greater percentage of carbohydrates also meant a greater incidence of abdominal obesity, hypertension, hypertriglyceridaemia, more components of MS and significantly more frequent diagnosis of MS. Several previous studies have shown that smoking is more prevalent amongst the depressive patients [52,55,56]. Contrary to the previous studies, we have sound no differences in smoking habits between the depressive patients and the control group, while those who had reported an absolute abstinence of alcohol showed the greatest levels of depression according to HAMD-17. Those subjects who reported themselves as smokers fulfilled the NCEP ATP-III criteria for hypertriglyceridaemia in significantly larger number, while there were no significant differences in alcohol drinking habits depending on the presence of MS.

Conclusively, the results of this study have shown a greater incidence of suicide amongst the depressive patients diagnosed with MS. From the psycho-social variables tested, we might say that the diagnosis of MS was more frequently established in depressive females. There is no adequate explanation for this in currently available scientific literature, so further studies are required to clarify these sex-related differences. Besides that, an increased intake of carbohydrates was a significant feature of both depression and MS in this study, which is a fact that requires further prospective studies do clarify if the interventions aimed at treating the depression could also contribute to accepting the healthy lifestyle, especially changing the dietary habits and consequentially, if the depression treatment could, indirectly, reduce the incidence of MS.

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None

Conflict of interest

None to declare

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Psihosocijalne i kliničke karakteristike depresivnih bolesnika s dijagnozom metaboličkog sindroma

Sažetak – Sve je više podataka koji pokazuju da teže mentalne bolesti imaju utjecaja i na tjelesno zdravlje. Depresija je kompleksna bolest povezana s promjenama u spavanju, apetitu, tjelesnoj težini i razini tjelesne aktivnosti što sve mogu biti rizični faktori za razvoj metaboličkih poremećaja. U depresivnih na razvoj metaboličkog sindroma mogu utjecati različiti fiziološki mehanizmi ali i različiti psihosocijalni čimbenici kao što su spol, dob, pušenje, razina stresa, ishrana, razina fizičke aktivnosti. Smatra se da kronični stres uzrokuje depresiju i posljedični loš životni stil koji može voditi u MS i posljedično razvoj KVB. Cilj ovog istraživanja bio je istražiti psihosocijalna i klinička obilježja depresivnih bolesnika s dijagnozom MS. Provedena je presječna studija na uzorku od 80 bolesnika s dijagnozom depresivnog poremećaja. Od dijagnostičkih instrumenata korišten je strukturirani sociodemografski upitnik, te MINI upitnik, ***Hamilton rating scale for depression*** (HAMD-17) i Clinical Global Impression (CGI). Dijagnoza metaboličkog sindroma se postavljala prema NCEP ATP III kriterijima. Postotak depresivnih ispitanika koji su zadovoljavali kriterije za dijagnozu MS bilo je 38,8%. Nađena je veća učestalost suicida u depresivnih ispitanika s dijagnozom MS, dijagnoza MS se značajno češće postavljala u depresivnih žena, pojačan unos ugljikohidrata je bio značajno obilježje i depresivnosti i MS. Potrebna su daljnja istraživanja u svrhu objašnjenja uočenih spolnih razlika, te da li intervencije usmjerene ka liječenju depresije mogu doprinositi prihvaćanju zdravih stilova života, posebno promjeni prehrambenih navika i tako neizravno doprinositi smanjenju pojavnosti MS.

Ključne riječi: depresija, metabolički sindrom, psihosocijalni faktori