

Anxiety and Depression in People with Epilepsy and Coronary Heart Disease: A Comparative Analysis

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Summary. *Background.* Depression as well as anxiety is a serious and frequent problem among people with chronic somatic illnesses that has significant negative impact on their quality of life. The study aimed to analyze symptoms of depression and anxiety in patients with epilepsy and compare findings to those with coronary heart disease.

Materials and Methods. The study was conducted in Vilnius university hospital Santariškių Klinikos. Patients with epilepsy were surveyed in Centre of Epilepsy; patients with diagnosed coronary heart disease were surveyed in Preventive Cardiology subdepartment. 806 patients were surveyed: 530 patients with epilepsy (PWE) and 276 patients with coronary heart disease (CHD). Patients were selected using systematic random sampling technique and given a few questionnaires: Hospital anxiety and depression scale (HADS) and Beck depression inventory (BDI). Socio-demographic questionnaire included questions about age, gender, place of residence, education, marital status, and anamnesis of depression and other psychiatric illnesses. We used HADS for evaluation of anxiety symptoms and BDI - of depression. Statistical analysis was performed using SPSS Statistics 22. Differences were considered statistically significant at $p < 0.05$ level for all tests.

Results. Patients with CHD were older than PWE (mean age was 55.8 ± 9.2 and 47.5 ± 10.3 years respectively). 216 (78.3%) of patients with CHD and 242 (45.7%) of PWE were male. Indistinct symptoms of anxiety were found in 44.3% of the patients with epilepsy and in 64.9% with CHD, symptoms of borderline anxiety were observed in 20% and 23.8% respectively, and distinct anxiety was found in 35.7% and 11.3% ($p < 0.001$). Mild symptoms of depression were found in 13.8% and 12.5%, moderate symptoms - in 24% and 5.1%. Severe symptoms of depression were demonstrated by 10.9% of the patients with epilepsy, but by none of cardiac patients ($p < 0.001$). Female patients with CHD were significantly more depressive and anxious than males ($p < 0.05$), while PWE showed no such difference ($p > 0.05$). In PWE, anxiety and depression levels were associated with place of residence ($p < 0.001$; $p = 0.013$), education level ($p < 0.001$; $p < 0.001$), and marital status ($p = 0.046$; $p < 0.001$), while patients with CHD did not show significant associations ($p > 0.05$). PWE more often had family history of mental illnesses or depression than patients with CHD (both $p < 0.05$).

Conclusions. PWE had more expressed anxiety and depression compared to CHD patients. Symptoms of anxiety and depression in PWE were more expressed among rural residents, people with lower education, and singles, while CHD patients showed no such association. Female patients with CHD were more depressive and anxious than males. PWE more often had family history of mental illnesses or depression.

Keywords: depression, anxiety, epilepsy, coronary heart disease, comorbidity.

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BACKGROUND

Epilepsy is one of the most common neurological conditions and is highly associated with psychiatric diseases. Already Hippocrates more than 2000 years ago described a bidirectional relationship between depression and epilepsy. As studies prove, depression is one of the most frequent comorbid psychiatric disorders in epilepsy [1] which significantly reduces quality of life [2]. However, depres-

sion and anxiety are also widespread among other chronic diseases such as diabetes, asthma, arthritis, and obviously heart diseases [3]. Cardiovascular Disease (CVD) that includes all diseases of the heart and blood vessels causes an estimated 4 million deaths in Europe, accounting for 45% of all deaths. Of these, 1.8 million die of coronary heart disease [4] which is one of the biggest disease burdens in developed countries and the most common single cause of death. It has been shown that depression is more prevalent among patients with coronary heart disease [5] than in general population and, vice versa, coronary heart disease is more prevalent in patients with major depression disorder [6]. In spite of the evidence that depression and coronary heart disease are comorbid conditions, pathophysiological mechanisms underlying the association remain unclear. These associations and currently known aspects of depression pathophysiology imply that depression may not be just a mood disorder and may involve mechanisms that affect multiple organs. Thus, we chose to compare two chronic diseases which directly affect different organ systems: nervous and cardiovascular. To our knowledge, there are no studies comparing symptoms of depression and anxiety between PWE and patients with coronary heart disease therefore this is the first publication not only in Lithuania but also in the international scientific literature.

OBJECTIVES

In this study we aimed to: 1) analyze symptoms of depression and anxiety in patients with epilepsy; 2) analyze symptoms of depression and anxiety in patients with coronary heart disease; 3) compare findings in these two groups.

MATERIALS AND METHODS

Cross-sectional study was conducted in Vilnius university hospital Santariškių Klinikos. 530 patients with diagnosed epilepsy were surveyed in the Centre of Epilepsy; 276 patients with coronary heart disease were surveyed in Preventive Cardiology subdepartment. Patients were selected using systematic random sampling technique. Questionnaire consisted of three parts: Socio-demographic questionnaire, Hospital anxiety and depression scale (HADS) [7], and Beck depression inventory (BDI) [8]. Socio-demographic questionnaire included questions about age, gender, place of residence, education, marital status, addictions, and family anamnesis of depression and other psychiatric illnesses.

We used HADS for evaluation of anxiety symptoms and BDI – of depression. HADS-A (anxiety) score between 0 and 7 was defined as indistinctive symptoms of anxiety; score between 8 and 10 indicated a borderline level of anxiety; score equal or greater than 11 was described as distinct anxiety.

BDI score range from 0 to 13 was considered as no or minimal depression, 14–19 as mild level of depression, 20–28 as moderate depression, and 29 or greater score as severe depression.

Statistical analysis was performed using SPSS Statistics 22. Pearson's Chi-Square, Fisher's Exact Test, and one-way ANOVA were used to evaluate statistical significance of severity of the symptoms between the groups. Spearman's coefficient was used for correlation. Differences were considered statistically significant at the $p < 0.05$ level for all tests.

RESULTS

Sociodemographic data is presented in Table 1. Among PWE, 37.2% of patients had generalized (84% idiopathic and 16% related to external causes) and 62.8% focal (21.8% with simple and 78.2% with complex seizures) epilepsy. More than two thirds (68.1%) of epilepsy patients experienced seizures once or more per month, 14.8% – from 1 to 11 seizures per year, 17.1% rarer than one a year. 24% of PWE do not use, 39.2% use one, 25.8% two and 11% three or more antiepileptic drugs (AEDs). There was a correlation between seizure frequency and level of depression ($r = 0.328$, $p < 0.001$). Among patients with CHD, 222 (81.3%) had a diagnosis of myocardial infarction.

Prevalence of anxiety and depression is shown in Figures 1 and 2. The average level of anxiety (score) was 8.74 ± 4.79 in PWE group and 6.20 ± 3.33 in CHD group ($p < 0.05$), and the level of depression (score) was 15.58 ± 11.51 and 8.49 ± 5.73 respectively ($p < 0.05$). Differences of anxiety and depression between genders are summarised in Tables 2 and 3.

Table 1. Sociodemographic data

	PWE	CHD	p value
Age, years	47.5±10.3	55.8±9.2	$p < 0.05$
Gender, males (%)	45.7	78.3	$p < 0.05$
Place of residence, urban (%)	75.1	80.8	$p > 0.05$
Addictions, alcohol and/or smoking (%)	30.0	30.1	$p > 0.05$
Education (%)			
• Higher	38.9	47.5	$p < 0.05$
• Secondary	51.5	26.1	
• Primary	6.4	3.6	
Family status (%)			
• With partner	56.6	82.8	$p < 0.05$
• Alone	43.4	17.2	
Family anamnesis of (%)			
• Mental diseases	13.3	2.5	$p < 0.05$
• Depression	16.3	4	$p < 0.05$

PWE – patients with epilepsy, CHD – patients with coronary heart disease

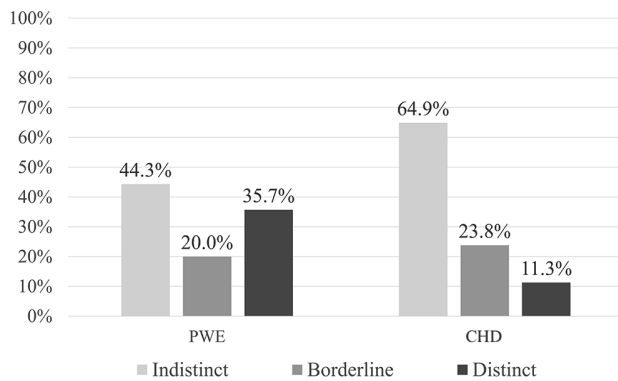


Fig. 1. Prevalence of anxiety among PWE and CHD patients by HADS-A score (p<0.001)

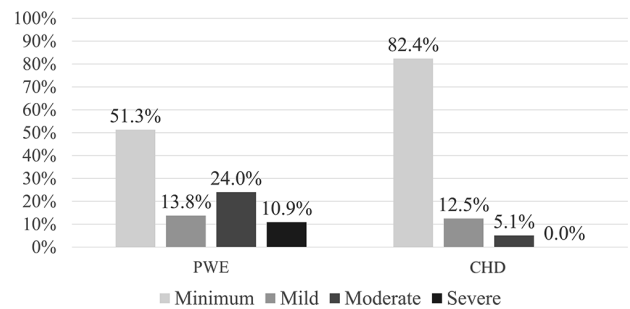


Fig. 2. Prevalence of depression among PWE and CHD patients by BDI score (p<0.001)

The level of anxiety did not correlate with age in both groups (PWE: r=0.029, p>0.05; CHD: r=-0.006, p>0.05). No significant correlation between the expression of depression and age was found either (PWE: r=0.079, p>0.05; CHD: r=0.132, p>0.05).

PWE patients had more expressed symptoms of anxiety and depression compared to CHD in the groups of place of residence, family status, and education (p<0.05). The level of anxiety and depression were greater among rural PWE (p<0.05). In CHD group, however, the level of

anxiety and depression was not associated with place of residence (p>0.05). Single patients with epilepsy had more symptoms of anxiety (p<0.05) and depression (p<0.05), but CHD group did not show statistically significant link between family status and symptoms of anxiety or depression. PWE with higher education were found to have fewer symptoms of anxiety and depression (p<0.001 in both cases), whereas CHD patients did not show such difference (Figures 3, 4).

Table 2. Prevalence of anxiety between genders

		Anxiety level			P value
		Indistinct	Borderline	Distinct	
PWE	Female	115 (40.8%)	56 (19.9%)	111 (39.4%)	0.232
	Male	113 (46.9%)	50 (20.7%)	78 (32.4%)	
Patients with CHD	Female	27 (50.9%)	14 (26.4%)	12 (22.6%)	0.007
	Male	134 (68.7%)	45 (23.1%)	16 (8.2%)	

PWE – patients with epilepsy, CHD – coronary heart disease

Table 3. Prevalence of depression between genders

		Depression level				P value
		Minimum	Mild	Moderate	Severe	
PWE	Female	136 (47.2%)	38 (13.2%)	77 (26.7%)	37 (12.8%)	0.097
	Male	136 (56.2%)	35 (14.5%)	50 (20.7%)	21 (8.7%)	
Patients with CHD	Female	37 (67.3%)	12 (21.8%)	6 (10.9%)	0 (0%)	0.003
	Male	173 (86.5%)	20 (10%)	7 (3.5%)	0 (0%)	

PWE – patients with epilepsy, CHD – coronary heart disease

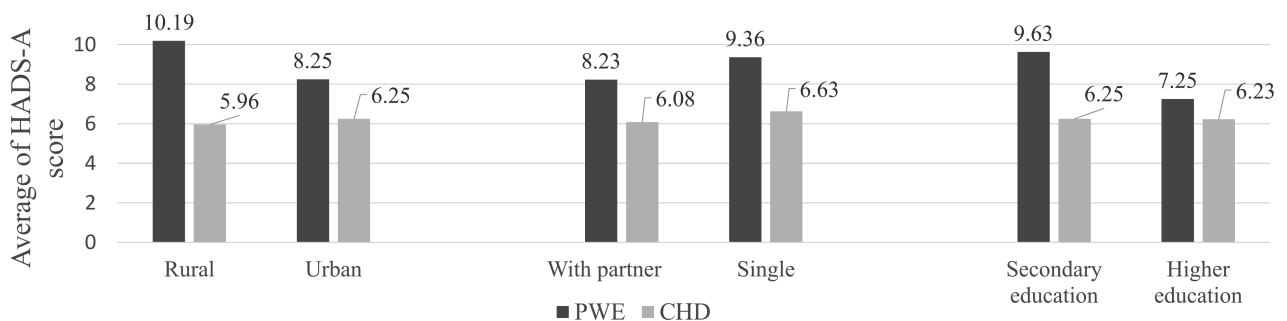


Fig. 3. Prevalence of anxiety among PWE and CHD patients by residence, marital status and education

DISCUSSION

Our study showed a high prevalence of depression and anxiety in patients with epilepsy. Due to presentation of seizures that have significant not only medical but also psychosocial impact on patients' life, epilepsy has been commonly accepted as a risk factor for psychiatric disorders. However, studies suggest that psychiatric disorders are risk factors for chronic illnesses including epilepsy [9, 10]. A few studies show that incidence of psychosis, depression, anxiety and suicidality in PWE is increased before and after the diagnosis of epilepsy [11, 12]. The prevalence of depression and anxiety in PWE varies widely – 9–37% and 11–25% respectively [13]; these results depend on

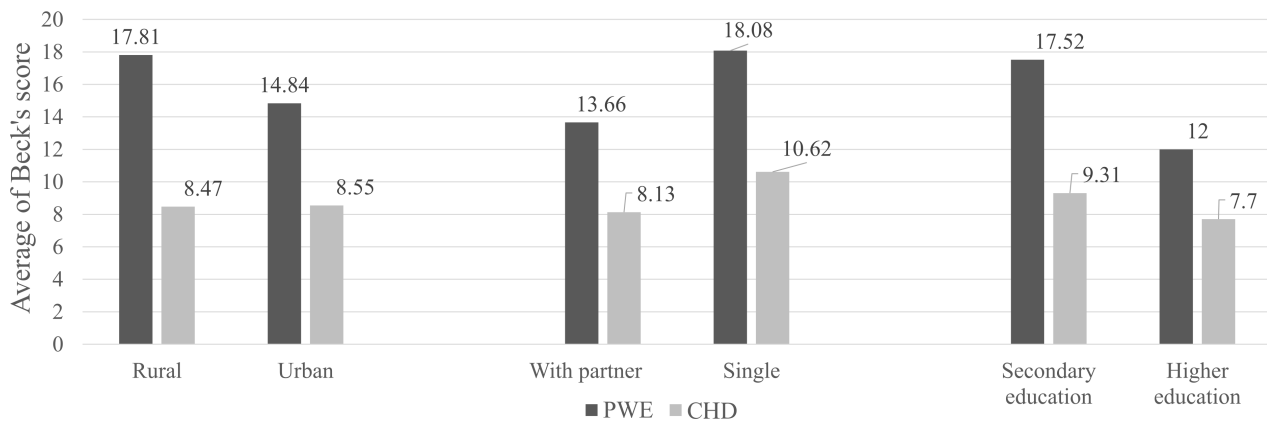


Fig. 4. Prevalence of depression among PWE and CHD patients by residence, marital status and education

population assessed and type of measures used. In comparison to our study, studies using BDI reported prevalence of depression in PWE 28–45% comprising mostly mild and moderate cases [13–15], while we found prevalence of 48%, moreover, 22% of them being with severe symptoms. Accordingly, prevalence of anxiety in PWE estimated using HADS was reported 20.5% [16], while we found 35%. There are multiple factors that could explain the differences. The study conducted in two primary care practices in the UK [17] reported the frequency of depression to be 33% in patients with frequent seizures and 6% in patients in remission due to AEDs. We found a weak correlation between level of depressive symptoms and seizure frequency. As our patients attended a tertiary clinic, they may have had difficulties in managing epilepsy by having more frequent seizures and using more AEDs.

Similar comorbid link has been found between CHD and depression: depressive symptoms among CHD patients varied from 20% to 37% after acute myocardial infarction and majority of them were still depressed in the year after discharge [18]; and vice versa, depressed patients have increased risk for CHD incident [19, 20]. In our study, 18% CHD patients showed depressive symptoms. The differences could be due to the fact that our study included all patients not considering the duration after acute myocardial infarction. Moreover, in our study not all patients with CHD experienced myocardial infarction.

These statistics show disproportionate prevalence of depression and anxiety in PWE and CHD patients in comparison to studies in other countries: while patients with CHD in our study do not considerably stand out, PWE present higher tendency for symptoms of depression and anxiety. Furthermore, comparing PWE to patients with CHD we found that PWE showed more severe symptoms of depression and anxiety. 11% of PWE had severe depressive symptoms, while patients with CHD had only mild and moderate depressive symptoms. Similar results were observed in anxiety. Female patients with CHD were significantly more depressive and anxious than males, while PWE showed no such difference. In recent literature reviews gender has been identified as a possible risk factor for depression in patients with myocardial infarction but not in patients with epilepsy: Doi-Kanno and Fukahori in

their study showed that females with CHD experience more depressive symptoms than males [21], while Lacey et al all found inconsistent results [22]. Also, we found that place of residence, marital status, and education had influence on depression and anxiety in PWE but not in patients with CHD. PWE feel lower self-confidence which leads to difficulties in interacting with the opposite sex, concealing the diagnosis from the partner, and sexual dysfunction [23]. It seems that sociodemographic factors have more impact on depression and anxiety among PWE than in patients with CHD.

Both diseases affect multiple aspects of people's lives, however Lithuanian people with epilepsy are still under intense psychosocial pressure especially singles and from rural areas. Although medicine in Lithuania follows the newest guidelines and is able to offer the most appropriate available treatment, patients still find difficulties in socialization [24]. Some patients still try to conceal their diagnosis; otherwise, they may have difficulties finding employment. Even having good education, PWE, especially men, still find it difficult to get a job [23]. These barriers may have significant influence on mental state of people with epilepsy.

Although epilepsy and coronary heart disease contain complex pathways of pathogenesis, comorbidities between them suggest that there may be a part of common mechanisms. Scientists are still trying to explore the pathophysiological relationship between depression and epilepsy, and many mechanisms for their bidirectional relationship have been suggested. Current data suggests that serotonergic transmission, disturbances of monoamine neurotransmitters or opioid secretion, pre-existing dysfunction of the hypothalamic-pituitary-adrenal axis (HPA-A), cerebral structural changes or chronic inflammation may each influence the development of epilepsy and depression [25]. Adibfar et al. briefly reviewed potential mechanisms of comorbidity between depression and coronary heart disease. They found that inflammatory markers such as cytokines and CRP, platelet function, activity of serotonin and catecholamines, thyroid function, morphological brain changes, dysregulation of HPA-axis, oxidative stress etc. might be common roots between these two conditions [26].

LIMITATIONS

This study has several limitations. The respondents were from only one geographic area, so it cannot be known if our findings are generalizable to other patient populations. Also, generalizability might be an issue as respondents were patients of a tertiary treatment center and may not represent a general population. We also did not use any questionnaires in this study to assess quality of life, emotional well-being, social function, attention, memory, role limitations, and its impact.

CONCLUSIONS

We can conclude that higher proportion of patients with epilepsy have symptoms of depression and anxiety in comparison to CHD patients. Symptoms of anxiety and depression in PWE are more expressed among rural residents, people with lower education, and singles, while CHD patients showed no such association. Female patients with CHD are more depressive and anxious than males. PWE more often had family history of mental illnesses or depression.

There is a great need for psychiatric and psychological consultations for all patients with chronic somatic diseases.

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NERIMAS IR DEPRESIJA TARP SERGANČIŲJŲ EPILEPSIJA IR KORONARINĖ ŠIRDIES LIGA: PALYGINAMOJI ANALIZĖ

Santrauka

Įvadas. Nerimas ir depresija yra dažna sergančiųjų lėtinėmis ligomis problema, kuri mažina gyvenimo kokybę. Šio tyrimo tikslas buvo išanalizuoti nerimo ir depresijos simptomus tarp sergančiųjų epilepsija ir palyginti su sergančiais koronarine širdies liga.

Tiriamieji ir tyrimo metodai. Tyrimas atliktas Vilniaus universiteto ligoninėje, Santariškių klinikose. Epilepsijos centre buvo apklausti pacientai, sergantys epilepsija; pacientai su koronarine širdies liga buvo apklausti ambulatorinės kardiologijos skyriaus prevencinės kardiologijos poskyryje. Buvo apklausti 806 pacientai: 530 asmenys, sergantys epilepsija (ASE), ir 276 – koronarine širdies liga (KŠL). Pacientai pasirinkti taikant sisteminės atsitiktinės atrankos metodą. Naudoti klausimynai: Ligoninės nerimo ir depresijos skalė (HADS) ir Beko depresijos skalė (BDI). Sociodemografinį klausimyną sudarė klausimai apie amžių, lytį, gyvenamąją vietą, išsilavinimą, šeiminių padėčių ir psichiatrinių ligų anamnezę. HADS klausimynas buvo naudojamas įvertinti nerimui, o BDI – depresijai. Statistinei analizei naudota programa SPSS Statistics 22, rezultatai laikyti reikšmingais, kai $p < 0,05$.

Rezultatai. Pacientai su KŠL buvo vyresni už ASE (vidutinis amžius – $55,8 \pm 9,2$ ir $47,5 \pm 10,3$ metų). 216 (78,3 %) KŠL pacientų ir 242 (45,7 %) ASE buvo vyrai. Neišreikšti nerimo simptomai buvo 44,3 % pacientų su ASE ir 64,9 % su KŠL, tarpiniai simptomai stebėti 20 % ir 23,8 % analogiškai, ir ryškūs simptomai nustatyti 35,7% ir 11,3% ($p < 0,001$). Lengvi depresijos simptomai nustatyti 13,8 % ir 12,5 %, vidutiniai – 24 % ir 5,1 %, sunkūs –

10,9 % pacientų, sergančių epilepsija, bet nė vienam kardiologiniam pacientui ($p < 0,001$). Moterys su KŠL turėjo labiau išreikštus nerimo ir depresijos simptomus nei vyrai ($p < 0,05$), o ASE grupėje to nebuvo ($p > 0,05$). Pacientų su epilepsija nerimo ir depresijos lygiai buvo susiję su gyvenamąja vieta ($p < 0,001$; $p = 0,013$), išsilavinimu ($p < 0,001$; $p < 0,001$) ir šeimine padėtimi ($p = 0,046$; $p < 0,001$); pacientams su KŠL reikšmingų sąsajų nebuvo rasta ($p > 0,05$). Pacientai su epilepsija dažniau turėjo psichiatrinių ligų ar depresijos šeimines anamnezę, nei KŠL pacientai (abu $p < 0,05$).

Išvados. Sergantieji epilepsija turi labiau išreikštus nerimo ir depresijos simptomus, nei pacientai, sergantys koronarine širdies liga. Simptomai labiau išreikšti tarp gyvenančiųjų kaime, su žemesniu išsilavinimu ir vienišų asmenų, tačiau sergantiesiems KŠL šių tendencijų nestebėta. Moterys su KŠL turi labiau išreikštą nerimą ir depresiją negu vyrai. Pacientai su epilepsija dažniau turi psichiatrinių ligų šeimines anamnezę.

Raktažodžiai: depresija, nerimas, epilepsija, koronarinė širdies liga, komorbidiškumas.

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