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The Prevalence of Depression and Anxiety in Seafarers Type 2 Diabetic Patients

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A B S T R A C T

Depression and anxiety are co-morbid condition in diabetes as disease-related psychological reactions on this chronic metabolic illness. This study was aimed to determine the occurrence of depression and anxiety in seafarer's type 2 diabetic patients. A random sample of 52 diabetic seafarers treated with diet and oral glucose lowering agents, and 56 healthy seafarers were screened for depression with The Beck Depression Inventory (BDI) and for anxiety with State-Trait Anxiety Inventory (STAI 1, STAI 2). Depression (BDI>18.5) and anxiety (STAI<28.5) was significantly higher in the group of diabetic seafarers than in control group (more than 30%). Significant correlation was noted between depression and duration of diabetes mellitus, degree of obesity and poor glycaemic control (HbA1C>8%) and longer duration of shipping routes (over 6 months). The proportion of depression and anxiety was found higher in seafarer's type 2 diabetic patients than in the healthy seafarers.

***Key words**: seafarers, type 2 diabetes mellitus, depression, anxiety*

Introduction

Depression and anxiety are prevalent co-morbid condition in diabetes as disease-related psychological reactions on this chronic metabolic illness. Among the patients with diabetes mellitus type 2, many studies have documented the high rate of depression, compared with no patient control subjects[1]. Anderson and colleagues showed that risk of depression might be at least doubled with diabetes compared to the general population[2]. The number of type 2 diabetic patients, during the past several decades, has greatly increased. Depression among patients has been associated with decreased self-management, poor metabolic control, and increased risk for diabetes-related complications[3–6]. These studies showed wide variations in the rate of depression among patients with diabetes due to differences in patient demographics, disease characteristics, business occupation and other factors that contribute to general psychological distress.

Seafaring is known as a dangerous occupation with a high risk of fatal accidents in workplace[7,8]. The population of seafarers has also been identified as additional health-hazard group and as a group with high mortality in general[9]. They have great responsibilities in working with ships under various environmental conditions, which cause general psychological distress of living with additional stress of having major chronic disease[10–15]. Tha aim of this study was to determine the occurrence of depression and anxiety in seafarers type 2 diabetic patients, and its association with glycaemic control, degree of obesity and chronic microvascular complications. The patients with cardiovascular complications were excluded.

Patients and Methods

The seafarers with type 2 diabetes treated with diet and oral glucose lowering agents, were invited to participate in s study of psychosocial factors and diabetes during the six months recruitment period. Individuals were ineligible for this study if they had been diagnosed with type 2 diabetes for less than one year or if, on independent review of their medical records (by a diabetologist), individuals had history of microvascular complications. The control group was healthy seafarers with similar

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sex, age and current life circumstances as seafarer. The data of age and on current life circumstances as seafarer (years on the ship, the duration of shipping routes during one year) were collected by a semi-structured interview.

The subjects completed The Beck Depression Inventory (BDI) and for anxiety with State-Trait Anxiety Inventory (STAI 1, STAI 2), all of which are well-known validated self-complete questionnaires that have been used extensively in many countries. These are short but reliable screening tests to determine presence of depression and anxiety[9,10]. BDI scores were defined as moderate-severe (scores>18.5), mild (scores 10–18.5) and low (scores<10). Scores of 18.5 and higher on BDI have been shown to approximate clinically significant levels of depression[9]. The STAI is an instrument that includes separate self-assessment scales measuring 2 independent concepts of anxiety: state and trait. While state anxiety is considered a transitory emotional condition, trait anxiety is defined as a relatively stable tendency towards anxiety. 10-item short form of the state component of the State Trait Anxiety Inventory was used to assess seafarers' anxiety with diabetes type 2 and healthy individuals, and it was significant STAI score <28.5 levels at each of the interviews[10].

The data about duration of diabetes mellitus, body mass index (BMI), glycaemic control, therapy of diabetes and microvascular complications were recorded from the patients medical records. Glycaemic control was measured by HbA1C, the normal range was <6.5%.

As statistical analyses, χ^2-test was used to examine differences in prevalence rates of depression and anxiety among these groups. For analyses other research questions (age, BMI, glycaemic control, duration of diabetes mellitus, years on the ship and the duration of shipping routes during the year) was utilized Student's t-test for comparing differences in means.

Results

We examined 52 seafarers with diabetes type 2 treated with diet and oral glucose lowering agents, mean age 43±8.2 years, body mass index (BMI) 30±8.2. The mean duration of diabetes was 5.9±3.9 years, 36 patients was treated with sulfonilureas and 16 with metformin. The mean value of long-term retrospective parameter, glycated hemoglobin HbA1C was 7.5±1.8%. The microvascular complications were present in 21% patients. The data is shown in Table 1.

The diabetic seafarers were compared to healthy seafarers with same psychological distress of living on the ship (Table 2). There was no statistically significant difference between ages of these two groups. In healthy seafarers BMI ($p<0.001$) and years spend on the ship ($p<0.05$) was significantly lower than in diabetic group. The duration of shipping during one year was significantly higher ($p<0.05$) in control group.

A random sample of 52 diabetic seafarers and 56 non-diabetic seafarers were screened for depression with

TABLE 1
CHARACTERISTICS OF DIABETIC TYPE 2 SEAFARERS (N=52)

Duration of diabetes (years)	5.9±3.9
HbA1C (<6.5%)	7.5±1.8
BMI (kg/m²)	30±2.4
Therapy diet, oral glucose lowering agents	
Microvascular complications	21%

TABLE 2
DEMOGRAPHIC CHARACTERISTICS OF THE SEAFARERS WITH TYPE 2 DIABETES (DM) AND HEALTHY SEAFARERS (C)

	DM (N=52)	C (N=56)
Age (years)	43±8.2	42±6.2
BMI (kg/m²)	30±2.4	25±1.6**
Years on the ship	24±8.1	22±7.9*
Duration of shipping during one year	6.65±2.3	7.4±3.1*

* $p<0.05$ *vs.* control, ** $p<0.001$ *versus* control

The Beck Depression Inventory (BDI) and for anxiety with State-Trait Anxiety Inventory (STAI 1, STAI 2).

Depression (BDI scores>18.5) was present in 17/52 type 2 diabetic seafarers (34%). BDI scores was mild (scores 10–18.5) in 11/52 diabetic seafarers and low (scores<10) in 24/52 diabetic seafarers. Control group had proportion of depression 6/56 (11%), mild levels depression 8/56 and normal levels 42/56 healthy seafarers. The type 2 diabetic seafarers were more than twice as likely to report depression compared to healthy seafarers; p= 0.002 (Figure 1).

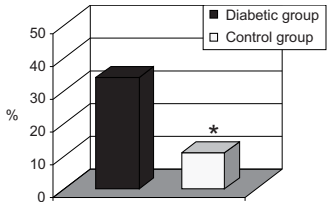

*Fig. 1. Proportion of diabetic and healthy seafarers reporting moderate-severe symptoms of depression (*p<0.05).*

Analysis of variance demonstrated that, for depressive symptoms, mean BDI scores, although all in the mild range, were significantly higher in diabetic group, with a significant covariant effect of duration of diabetes (p= 0.005), BMI (p=0.03) and level of glycaemic control (p= 0.001). In both group, significantly effect on depressive symptoms had duration of shipping routes during one year (diabetic group p=0.004; control group p=0.02).

STAI score was used to measure the level of anxiety in these two groups. It has been done STAI 1 (for state anxiety which is transitory emotional condition) and STAI 2 (for trait anxiety which is relatively stable condition).

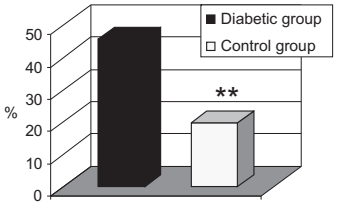

*Fig. 2. Proportion of diabetic and healthy seafarers reporting moderate-severe symptoms of anxiety (**p<0.001 versus control).*

The significant STAI score<28.5 for anxiety was present in 24/52 type 2 diabetic seafarers (46%). In control group significant STAI score was present in 11/56 healthy seafarers (20%). The type 2 diabetic seafarers had more than twice report compared to healthy seafarers; p= 0.001 (Figure 2). In both groups, there was a high correlation between depressive symptoms and symptoms of anxiety.

Discussion

Depression and anxiety are associated with diabetes. The complex interactions of physical, psychological, and genetic factors that contribute to this association remain uncertain. The prevalence of depression in diabetes from 39 studies is that diabetes doubles the odds of depression[2]. Depression may occur secondary to diabetes or to diabetes-related abnormalities in neurohormonal or neurotransmitter function[16]. Some prospective studies indicate that depression doubles the risk of incident type 2 diabetes independent of its association with other risk factors[17]. The depression rates were approximately two to three times higher in studies that used self-report measures *vs*. diagnostic interviews. These two approaches identify somewhat different but overlapping samples of depressed individuals. Diagnostic interviews identify major depressive disorder but exclude other clinically relevant presentations. Self-report measures can identify most cases of major depressive disorder. Self-report measures may identify a broader spectrum of depression disorders (e.g., dysthymic disorder, or minor or subsyndromal depression) or symptoms that reflect co morbid psychiatric illness (e.g., anxiety or substance-abuse disorders) or general distress.

Depression and anxiety for patients with diabetes are not just predictors from diabetes-related stresses alone[11]. Many variables can influence on depression and anxiety, such are patient education, financial stress; stress at work and in the family associated with poor conflict resolution around diabetes[2]. It is necessary to view depression symptoms within the broad context of general psychological distress and to observe psychological distress within the broad context of general life functioning. Psychological distress refers to the stresses associated with work, finances, and family, as well as diabetes.

Work of seafarers is very complex because they must be capable of carrying out their work in all situations far away from home for long period[18]. The current periodic examination system must prevent effectively possible health defect from work and made to ensure their working capacity. There are few studies which explore the influence of seafarer's life on cardiovascular morbidity and mortality[19,20]. Among seafarers there is high incidence of factors for development of cardiovascular disease[21,22]. One of them is diabetes mellitus type 2.

Psychological distress of living and having a major chronic disease for cardiovascular morbidity made that diabetes mellitus doubles the odds of depression. Stress of seafarers depends on occupational group (higher in engine crew), personally characteristics, work-related factors (noise, climatic conditions, received appreciation) and free-time activities[23–25]. The aim of this study was to determine the occurrence of depression and anxiety in seafarers type 2 diabetic patients and its association with glycaemic control, degree of obesity and chronic microvascular complications. Concerning to our knowledge, there is no systematic studies about the effects of life context on board on the linkage between depression and diabetes.

We hypothesized that diabetic patients would have additional predictors for depression and anxiety, not just predictors from diabetes-related stresses alone. We examined diabetes with four indicators of disease: time since diagnosis, BMI, HbA1C and number of patient self-reported co morbidities, which can serve as diabetes-related stress. The diabetic patients were mean age of 43±8.2 years, BMI score 30±8.2, the mean duration of diabetes 5.9±3.9 years. They were treated with diet and oral glucose lowering agents, 36 patients with sulfonilureas and 16 with metformin. We use the self-report measures for depression (BDI) and anxiety (STAI 1, STAI 2).

In this study, we have observed diabetic seafarers-specific differences in the relationship between symptoms of depression and anxiety and the performance of aspects of seafarers-life conditions (years on board, duration of shipping during one year). The diabetic type 2 patients had more then twice higher proportion of depression (34%) and anxiety (46%) compared to healthy seafarers. This is comparable with studies on depression and anxiety among diabetic patients without the investigating the influence of occupational circumstances[1,2,5,16,17]. The selected risk factors for depression were duration of disease, degree of obesity and level of glycaemic control. The longer duration of shipping routes (over 6 months) was observed to significantly associate with depression and anxiety among diabetic seafarers. One possible explanation is that diabetes mellitus is an additional factor for stress on work, because is chronic, progressive disease associated with various complications and high morbidity and mortality. Medical assistance to seafarers is very variable and depends of many various factors (general and local). The severity of depression and anxiety, in both groups, had been linked to the longer duration of shipping route during one year.

The periodic health examination system must be used to prevent development of all chronic diseases, like diabetes mellitus type 2 with its all complications[26–30]. Performing additional screening tests for depression and

anxiety in routine work help us to prompt detection and treatment of both, diabetes and disease-related psychological reactions and mental disorders. The utility of considering many life stresses can prevent negative behavioral and emotional outcomes[31].

The effects of general life, work and diabetes-related stresses are experienced cumulatively as general psychological distress and not only as depression in seafarer's type 2 diabetic patients.

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UČESTALOST DEPRESIJE I ANKSIOZNOSTI KOD POMORACA S TIPOM 2 ŠEĆERNE BOLESTI

SAŽETAK

Depresija i anksioznost su pridružene bolesti uz tip 2 šećerne bolesti kao psihološka reakcija na razvoj ove kronične metaboličke bolesti. Cilj studije je određivanje učestalosti depresije i anksioznosti kod pomoraca s tipom 2 šećerne bolesti. U studiju su uključena 52 pomorca s tipom 2 šećerne bolesti liječenih dijetom i peroralnim hipoglikemicima, te 56 zdravih pomoraca, koji su testirani za depresiju s Beckovim upitnikom za depresiju (BDI) i upitnikom za anksioznost State-Trait Anxiety Inventory (STAI 1, STAI 2). Depresija (BDI>18,5) i anksioznost (STAI<28,5) su bili signifikantno viši u skupini pomoraca liječenih od šećerne bolesti tip 2 u odnosu na kontrolnu skupinu (više od 30%). Signifikantna korelacija je uočena između depresije i trajanja šećerne bolesti, stupnja preuhranjenosti, loše glikemičke kontrole (HbA1C>8%) i dulje vremensko trajanje plovidbe (preko 6 mjeseci). Depresija i anksioznost su više prisutne u skupini oboljelih pomoraca u odnosu na skupinu zdravih pomoraca.