Depression screening and risk profile in diabetic patients

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Abstract: Depression is more common and severe in people with diabetes, decreasing the glycemic control and quality of life and increasing the risk for long-term complications. In the same time, it can lead to acute life threatening medical crises, including suicidal risk. The aim of our study was estimate the prevalence of depression and asses its severity on a group of diabetic patients. In addition we aimed to identify clinical factors associated with the risk for depression. The study group included 198 diabetic patients. Depression screening was performed with the 21-item Beck Depression Inventory (BDI). The mean BDI score was 11.4, indicating mild depression. 58% of patients had significantly elevated levels of depressive symptomatology. Severe depression score was found in 25% of recently diagnosed (< 1 year) patients and 28% of patients with short duration diabetes (1-4 years). Patients not performing self-monitoring of blood glucose (SMBG), those with 2 or 3 chronic complications and those who were overweight showed the highest prevalence of depression. Instead of labeling the patient as “non-compliant”, the diabetologists might develop the ability to easily and accurately diagnose depression.

Key Words: diabetes mellitus, depression, vulnerability, quality of life, BDI.
respond poorly to lifestyle interventions annihilating the efforts to control diabetes and prevent late complications. The course of depression as well may be more chronic and severe in people with diabetes with more frequent and severe episodes. Finally, depression increases the risk of acute medical emergencies in diabetics, particularly the risk of severe hypoglycemia [10]. By all these, depression in diabetics is associated with significantly higher mortality [11].

A particular problem (with possible medico-legal implications) is represented by the increased risk of suicide in diabetic patients, especially when associated with depression and especially in young ages. Thus, in a British survey, type 1 diabetes subjects had 11 times higher suicide rates compared with the general population [12] while studies in USA [13] and Korea [14] showed increased rates of suicidal ideation in diabetic adolescents. Most frequent suicide method is self-poisoning [15], including use of diabetes treatment overdoses. Most often the drug used is insulin [16] but also newer anti-diabetic drug classes such as GLP-1 analogs [17] and DPP4 inhibitors [18] were described.

Thus, psychological problems represent a clear and present danger for many people with diabetes, and the need to effectively address these problems is equally clear. Unfortunately, most estimates suggest that only about 30-50% of people with diabetes and major depression are recognized and treated [9].

The primary aim of this study was to detect depression and assess its level of severity in a group of diabetic out-patients registered at the “Prof. NC Paulescu” National Institute of Diabetes, Nutrition and Metabolic Diseases from Bucharest. In addition we aimed to assess the possible associations with clinical parameters that might outline a depression risk profile in diabetic patients.

MATERIALS AND METHODS

The design of the study was observational, descriptive, and transversal. The protocol of the study was approved by the local Ethics Committee and all subjects signed prior to inclusion an informed consent obtained according to the World Medical Association Declaration of Helsinki.

The study group included 198 diabetic subjects, 101 Males (51%)/97 Females (49%), 101 (51%) with T1DM and 97 (49%) with T2DM, with a mean age of 46 ±13.4 years. All patients had diabetes duration > 6 months and a rather poor metabolic control (HbA1c 8.87±1.7%).

Subjects were screened for depressive symptoms using the 21-item Beck Depression Inventory (BDI) [19, 20]. The BDI questionnaire is self-administered, taking 5-10 min to complete. Each item assesses certain specific areas of functioning (self-esteem, quality of life, mood, communication and social interaction, appetite and weight, trouble sleeping) and is represented by four statements with three levels of severity. BDI is scored easily by summing the ratings for each of the 21 items. BDI score ranges between 0 and 63. Higher score indicates higher severity of depression. We excluded 3 items (17, 19 and 20) referring symptoms that might be physical manifestations of diabetes (fatigue, significant weight loss, health preoccupation) in order to reduce the likelihood of over-diagnosis. Consequently the maximal score lowered from 63 to 54 and the cut-off score for depression lowered from 12 to 9, a score that would capture at least 90% of patients with diagnosable depression.

We analyzed prevalence and severity of depression on the whole study group as well as on subgroups according to age, sex and diabetes duration. We also analyzed the association between the presence of depression and some clinical/biochemical parameters such as availability of self-monitoring of blood glucose (SMBG), weight status, presence of chronic complications and metabolic control reflected by the HbA1c. Pearson's correlation coefficient (r) was used to measure the strength of the association between two variables and its significance with t-distribution test using the SPSS software.

RESULTS

The mean Beck depression score was 11.4, indicating a mild depression. The lowest score was 0, the highest 39. More than half (58%) of diabetic subjects had significantly elevated levels of depressive symptoms. Depression rate was higher in females (68%) than males (50.5%). As shown in Figure 1, the most frequent was the mild depression (30%) while severe depression was identified in 22.7% of females and 9.6% of males.

Figure 1. Distribution of patients according to depression level measured with the Beck Depression Inventory.
We also explored the prevalence and severity of depression in different age groups and we found the highest rates of depression for the age group of 40–59 years. As shown in Figure 2, the 40–49 age group had the highest prevalence of moderate and severe depression, while the 50–59 age group had the highest prevalence of mild depression. Less than a half of patients younger than 40 years reported depressive symptoms, while more than half from patients older than 40 years reported depressive symptoms.

![Figure 2. Prevalence and severity of depression in different age groups.](image)

Considering the duration of diabetes, 36% patients with diabetes duration <1 year reported depressive symptoms of which 25% were classified in the severe depression group. However, 77% patients with diabetes duration 1-4 years reported depressive symptoms, of which 28% had severe depression (Fig. 3).

![Figure 3. Prevalence and severity of depression according to diabetes duration.](image)

Patients not performing SMBG, those with 2 or 3 chronic complications and those who were overweight showed the highest prevalence of all depression levels. We found a single and weak positive correlation between depression and HbA1c (r=0.3), statistically significant with a likelihood of 99%. Depression correlated also with female gender, T2DM, age < 30 or > 40 and duration of diabetes >10 years.

**DISCUSSIONS**

Depression in diabetic patients frequently remains unrecognized and untreated [21], partially because of the similarity of depressive and diabetic somatic symptoms (insomnia, fatigue, appetite troubles, sexual dysfunction) and to the perception that depression is secondary to the medical condition, and thus not of independent importance. Other reasons for depression under-diagnosis include physicians lack of specific training to perform psycho-diagnostic interviews [21].

In our study we used for depression screening the BDI method, which is a simple, straightforward and self-administered questionnaire. By this method, we found that more than 58% of diabetic subjects from our cohort exhibited significant depression symptoms. This is a little bit higher than previously reported depression rates in diabetics which range between 30% [2] and 50% [3]. In our study group depression was almost 40% more frequent in females compared to males. These findings are in accordance with the sex difference observed in studies of the general population, female gender being associated with poorer psychological well-being and adaptability to diabetes [22].

The symptoms of depression and diabetes may exacerbate one another contributing to a disastrous cycle of poor self-care, deteriorating diabetes control and deepening depression [5]. In the same time, depressed patients respond poorly to diabetes treatment and exhibit high rates of treatment non-adherence, jeopardizing efforts to optimize the metabolic control [23]. Finally, depression in diabetics can significantly increase the rate of suicide attempts [12, 13], often with medico-legal implications due to the use of antidiabetic medications in these attempts [16-18]. To prevent all these, depression screening in diabetics followed by its proper treatment is very important. Thus, several studies proved the positive effects of anti-depressive treatment on glycemic control, mood, quality of life, and reduction in diabetes complications [24, 25].

Our study has several limitations, including the rather small number of patients, its observational nature and the lack of a control comparative group from the general population. However, it has also some strengths, including the use of the BDI instrument and proving that it can be easily used in an out-patient setting. In addition, to our best knowledge, this is the first attempt to evaluate the prevalence of depression in diabetic patients in Romania. We finally identified some clinical markers such as female sex, overweight, older age, long diabetes duration, poor metabolic control and lack of SMBG as potential risk indicators for depression presence in diabetic patients.
CONCLUSIONS

In our study group, 58% of patients with diabetes asking for medical assistance were identified with depression symptoms using the BDI questionnaire. BDI is a brief paper and pencil screening instrument capable of detecting depression in outpatient medical settings. It helps to focus the health care team on patients in need of distinctive and effective psychological treatment. Instead of labeling the patient as “non-compliant”, diabetologists should develop the ability to easily and accurately diagnose depression.

References