

## REVIEW

### The Influence of Anxiety and Depressive Syndrome on Treatment Adherence in Diabetes Mellitus

TEODOR SALMEN<sup>1</sup> ✉, CRISTINA BICA<sup>1</sup>, CAMELIA SANDU<sup>1</sup>,  
CRISTIAN SERAFINCEANU<sup>1,2</sup>, ANCA PANTEA STOIAN<sup>2</sup>

<sup>1</sup>INDNBM N.C. Paulescu, Bucharest, Romania

<sup>2</sup>“Carol Davila” University of Medicine, Bucharest, Romania

**Correspondence to:** Teodor Salmen, INDNBM N.C.Paulescu, Bucharest, Romania,  
e-mail: teodor.salmen@gmail.com

#### Abstract

*Diabetes mellitus (DM) is the chronic disease with the prevalence in a continuous rise – reaching a percent of 8.5% from the general population in 2014. Depression is a medical condition more frequently associated with chronic illness such as DM and highly associated with a more reduced quality of life and adherence to medical recommendations. We used the PubMed library and searched after the following key-words: type 1 diabetes mellitus, type 2 diabetes mellitus, anxiety, depression, depressive syndrome, treatment adherence, life quality. Diagnose of a new condition such as DM may be a traumatic experience for patients which could deny the reality, could accuse others of their problems or could refuse to go for a second opinion medical advice, to admit the truth. The newly diagnosed cases of type 2 DM benefit from unique medical training just from the perception of the illness point of view, while the evolution of parameters such as HbA1c does not differ significantly compared with usual care. Also, in newly diagnosed patients with type 2 DM, there is a higher incidence of depression and lower mental quality of life.*

**Key words:** diabetes mellitus, quality of life, depression, newly diagnosed diabetes mellitus, treatment adherence.

#### Introduction.

Diabetes mellitus (DM) is the chronic disease with the prevalence in a continuous rise – reaching a percent of 8.5% from the general population in 2014 [1]. There are two main types of diabetes known – type I or autoimmune diabetes, secondary to  $\beta$  pancreatic cells deficiency developed through auto-antibodies; and type II, developed by insulin resistance, fact that progressively exhaust the pancreatic secretion of insulin [2].

Diagnose of a new condition such as DM may be a traumatic experience for patients which could deny the reality, could accuse others of their problems or could refuse to go for a second opinion medical advice, to admit the truth. On the other hand, there are the patients that had a long evolution from the moment of diagnosing of their condition. These two categories of diabetic patients have different influences from the depressive syndrome – the first category tends to be more willing to do something in order to influence the disease evolution, while the second one tends to be more at

peace saying that this is the natural course of life, respectively ageing, and that earlier or later they would inevitably have to face the reality [3,4].

The most sensible category of patients is represented by the one that develops a chronic disease over an already established depressive syndrome. This type of patients will benefit fully from the intervention of professional therapy.

An essential element to take into consideration for patients with the depressive syndrome is the socio-economic status because it profoundly influences the adherence to treatment by exaggerating the perception of how unfavourable things are.

Two important concepts mentioned in several studies refer to the anthropological framework of syndemics and chronicity, with the accent on the first of them. Syndemics refers to the holistic view of the patient – not only the individual experience reflected in the epidemiological context is important, but, also, the socio-cultural environment of the patient, the political decisions that affect the patient's situation. So, the authors emphasise on taking more into consideration aspects like poverty, stress encountered by a population or social relationships that could affect the well-being of patients. Chronicity describes the alteration that a chronic disease produce in a patient, how this never-ending process influence patients life, choice in being adherent to a treatment or to a recommendation of follow-up that are so important in such ailments and how the impact of its financial status or the context of its country (e.g. war, economic crisis) determines or forces him to neglect its health.

### **Material and Methods**

We used the PubMed library and searched after the following key-words: type 1 diabetes mellitus, type 2 diabetes mellitus, anxiety, depression, depressive syndrome, treatment adherence, life quality.

We select the article who were directly linked with our purpose. After we analysed the library, we included 11 studies referring to the connection between DM and depression in either direction.

### **Results and Discussions**

Interpretations from studies of Poverty, Depression, and Diabetes presents this concept by two case studies. Firstly, they present the case of a Mexican female, with chronic ailments - DM and depression, uneducated – because as a young person she had to take care of her siblings, who lived in poverty - she married with a diabetic alcoholic husband who neglected his ailment until he hanged himself, who refuges with her daughter in Chicago – where she works under-the-counter and has to face the same story – her daughter is abused, so she takes her grandson and move separately, but, because she has to take care of him, she neglects her diseases; fact that emphasizes the VIDDA syndemic. The second case, a female orphan who marries and have kids, but because they have no extended family in Delhi are trapped to work a low paid job which provides them with a room, so she became underweight and depressive, neglect her health because of poverty and finally associate DM, being trapped in the vicious circle of not being able to take a better-paid job, feeling bad because of the neglected diabetes symptoms and feeling incapable of building a future for her children [5].

In "Beyond Comorbidity: A Critical Perspective of Syndemic Depression and Diabetes in Cross-cultural Contexts" article, they discuss several topics such as that the comorbidity from the anthropological point of view refers to somatisation or to the way social environment influence comorbidities, not intertwining their intervention or that syndemics is the key concept that takes into consideration not only the relationship between environment and ailments but, also, with disease distribution across a certain

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population. Also, they try to answer the question if syndemics is a transnational problem and they answer with a certain yes, on the consideration of the diversity met across geographical, cultural and economic coordinates. They, also made a 60 people narrative interview study in Urban India, that emphasize that the incidence of DM, depressive symptoms increase with the lowering of social status. In South Africa, they conducted the historical interview study only on 27 available females stated that DM prevalence starts to increase from the middle-class and is highly influenced by the food insecurity or unsafe of their neighbourhood [6].

A cross-sectional survey in Brasil, with three-stage randomization with 60202 individuals included analysed two patients presenting DM or depressive symptoms. The results included the fact that only 0.91% patients presented both DM and depressive symptoms, the clustering of these two ailments is favoured in obese patients and females with short education and low income – condition frequently found in the case of females that suffered from violence. Another important conclusion is that the association between DM and depression lead to higher rates of disability. Taking into consideration the context that Brazil is a large country with a high variability of its inhabitants, there is hard to draw some firm conclusions, because of the economic and educational factors that are highly influencing the problem and which are unevenly distributed [7].

"Depression in diabetes mellitus: a comprehensive review", states that depression despite its high prevalence, associates a high recurrence and persistence, decreasing the quality of the patients` life making it a significant determinant of the patients` compliance and, especially, adherence to the medical recommendations. Also, depression proved in a 4385 diabetic patients study to be severely

underdiagnosed (49%) and only almost a third (31%) of the patients received correct dosage or amount of the medication and psychotherapy. There is also recommended a multidisciplinary approach in diabetic patients that associated depression [8].

In the other important study regarding the link between depression and diabetes, they aimed to evaluate the diabetic patients through the prevalence of anxiety and depression using the Beck inventory questionnaires for this two pathologies and taking into consideration demographic elements such as age, gender, level of education and occupational status. The study results are that from the total of 184 diabetic patients, depression was found in 70.7% of cases, while anxiety was identified in 69.6% of cases. Moreover, the relation between diabetes and depression was discovered to be affected by sex (OR: 2.767), age (OR: 2.222), level of education (OR: 4.145) and job status (OR: 3.901), while the relation between diabetes and anxiety is influenced by gender (OR: 2.274), age (OR: 2.706) and Job Status (OR: 2.441). The conclusions drawn were that DM associates highly with depression and anxiety and that these interactions are amplified by factors related to the socio-economic status of the patient: age, gender, job and education [9].

"Depression and diabetes – Impact of Depressive Symptoms on Adherence, Function and Costs" evaluated the symptoms of depression and their influence on the adherence to medical recommendations and costs derived from it in a primary care setting for DM. They included 367 patients with both type 1 and 2 of DM from two different centres who received questionnaires to provide the necessary data. After distributing the patients in tertiles after the depressive symptoms severity, they obtained that adherence decreased from the medium tertile. The biggest difference regarding the days in non-adherence to oral

hypoglycaemic regime proved to be between the high and low tertiles, almost two-fold higher (7% vs 15%). Other relevant differences encountered were higher costs for the healthcare system, because of a higher probability to need medical assistance or inpatient, poorer outcomes and poorer physical and mental function [4].

The review "The association between Diabetes mellitus and Depression" aimed to emphasize the link between DM and depression and to understand its physiopathology mechanism. What is important to say is that even the World Health Organization warns us about the serious gap that is between mental health problems and the resources that are used to treat them. However, what is most important is that the diabetic specialist to pay attention to this frequent comorbidity associated with DM and to manage it a multidisciplinary team, to minimize the patient's number of DALYs or, even, to decrease the mortality [10].

"Depression and Quality of Life in Patients with Diabetes: A Systematic Review from the European Depression in Diabetes (EDID) Research Consortium" included 20 studies (18 cross-sectional and two longitudinal) related to diabetic patients regarding their quality of life, even if they associate or not depressive symptoms. The results found a moderate negative association between depressive symptoms and generic quality of life in diabetic patients, especially regarding the physical and mental health, a moderate to severely negative association between depressive symptoms and specific quality of life in diabetic patients regarding their satisfaction with the treatment or with the idea of the treatment that they have to adhere to, a mild to moderate positive association between depressive symptoms with domain-specific quality of life with a greater reporting for functional limitations, a lower self-reported health and cognitive impairment [11].

In "Effectiveness of a diabetes education and self-management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: three-year follow-up of a cluster randomised controlled trial in primary care", a multicentre randomised controlled trial in primary care with 824 patients newly diagnosed with type 2 DM from 207 centres, a six hours educational programme was compared with usual care by glycated haemoglobin (HbA1c) level and by secondary outcomes like smoking status blood pressure, depression and emotional impact of diabetes. The included patients were divided into a control group of 387 patients and an intervention group of 437 patients, with a total of 743 patients that were eligible at the three-year follow-up. The results state that there were no significant differences in case of a single educational programme for newly diagnosed type 2 DM patients, but the benefits were gained in several illness beliefs, such as a decrease in the proportion of non-smokers at 12 months, but it ceased at three years follow-up or in a better understanding of the disease with a better ability to cope with it [12].

"Increased Depression Symptom Score in newly diagnosed Type 2 Diabetes Patients" analysed the data from DIAREG registry – 1807 type 2 DM patients from which only 270 cases had completed all outcome questionnaires. Approximately half of the patients have a long duration of DM evolution, but with a well-controlled disease. What is important to emphasize is that the patients with short DM evolution – shorter than two years, presented higher depressions scores and a lower average mental sum score [13].

Analysing the depression even more, in the article "Investigating Factors Associated with Depressive Symptoms of chronic Kidney Diseases in China with Type 2 Diabetes" has evaluated the depression in patients with type 2 DM and chronic kidney

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disease (CKD), by a cross-sectional analytic study that included 210 patients with both type 2 DM and CKD. This study confirmed that the quality of life is inversely correlated with depression. Also, depression was found in 21.4% of diabetic patients and was proved to be statistically significantly associated with female gender, yearly income, clinic visit frequency, blood glucose monitoring frequency and duration of diabetes, while the depressive symptoms had higher rates in IV-V stage of CKD comparatively with I-III stages and using stepwise logistic regression they found out that in a patient with type 2 DM and CKD a predictor for developing depressive symptoms are represented by female gender, complicated arterial hypertension and the severity of type 2 DM related to CKD [14].

### Conclusions

Chronicity is an important element that states that socio-economical, demographical factors influence not only chronic illnesses but, also, that chronic illness influences each other evolution, progression and instalment. Syndemics points out that certain factors (sociological, demographical, geo-political) influence an ailment, but, also, the cultural, environmental or economic factors are involved. An excellent example is that Brazilian epidemiological analysis that shows that even if there are found out some facts that seem to allow drawing a firm conclusion, they are highly influenced by the uneven distribution of the inhabitants – from the economic and cultural point of view, especially in a large country, in short by syndemics.

DM not only that is highly associated with depression, but their mix and a low rate of correctly diagnosing and adequate treatment result in its persistence and recurrence, amplifying the impact of the already existing comorbidities. So, there is very important that the diabetic specialists take it seriously into consideration and so to

prevent the increased number of patients DALYs or, even, the patient's mortality. DM is highly associated with depression and anxiety, and these associations are influenced by factors like age, education, job or gender. Moreover, higher severity of the depressive symptoms transcripts in a higher burden for the healthcare system through the higher need for medical assistance – ambulatory or as an inpatient, lower prognosis, outcome or physical function.

Quality of life - with its components generic and domain-specific, declines in the presence of depressive symptoms. Moreover, the person with diabetes that associates depressive symptoms have a lower specific quality of life, thus, supposing to be a good predictor for developing functional limitation in the future.

The newly diagnosed cases of type 2 DM benefit from unique medical training just from the perception of the illness point of view, while the evolution of parameters such as HbA1c does not differ significantly compared with usual care. Also, in newly diagnosed patients with type 2 DM, there is a higher incidence of depression and lower mental quality of life.

In patients with type 2 DM with CKD, depression is predicted to appear by factors like female gender, complicated arterial hypertension and the severity of type 2 DM related to CKD.

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