

Diabetes & its Complications

Anxiety and Depressive Disorders in Diabetic Pregnant Women

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ABSTRACT

Background and Objective: Diabetes is associated with an increased risk of depressive and anxiety disorders. During pregnancy, this risk is higher considering the physiological and psychological changes that occur in this condition. Our objective was to assess the prevalence and identify the factors contributing to the increase of these disorders in this population.

Methods: We conducted a descriptive prospective study that included 100 diabetic pregnant women followed in our department (January 2017-March 2018). Based on the Hamilton Anxiety Scale and the Beck Depression Scale in their Arabic version.

Statistical analysis: SPSS software.

Results: 32% of our patients had gestational diabetes (GDM), 68% pregestational diabetes. Mean glycated hemoglobin (HbA1c) was 8.5%. Anxiety was objectified in 65% of the patients, the depression was found in 30%. Anxiety was significantly associated with GDM, with a history of maternal or fetal complications of pregnancy, low socio-economic status, and insulin therapy ($p < 0.001$). Depression was significantly associated with Type 1 diabetes ($p < 0.001$).

Discussion: Our study has demonstrated a high incidence of depressive and anxiety disorders in women with diabetic pregnancy, hence the need for systematic screening and management of this condition.

Keywords

Diabetes, Pregnancy, Anxiety, Depression, Hamilton anxiety scale.

Introduction

Numerous epidemiological studies have shown, that diabetes, anxiety and depressive disorders are not accidentally associated and complicate each other [1]. Pregnancy is considered as a period of vulnerability, both metabolically and psychically [1].

Carbohydrate metabolism disorders, more and more frequent during pregnancy, affect 16.2% of the world population with a prevalence

of 21.8% in the MENA region (Middle East and North Africa) and can range from " a simple glucose intolerance to diabetes mellitus. The treatment consists on dietary management associated, when necessary, to insulin therapy if the glycemic balance is not reached. Consequently, the installation of hyperglycemia during pregnancy is an aggravating factor, with a risk of harmful repercussions on the mental health of pregnant women [1].

Psychosomatic variations during pregnancy, include anxiety disorders, mood disorders, and depression, which are more common in the perinatal period [2].

As a result, diabetic pregnancy is considered to be at high risk, hence the need for systematic screening for mental disorders and adequate management in order to improve the maternal and fetal prognosis in this population.

The objective of our study was to assess the prevalence of depression and anxiety in a population of pregnant diabetic women and to determine the factors associated with the occurrence of these disorders.

Methods

This was a prospective descriptive study including 100 patients followed in the diabetology endocrinology department of the Ibn Rochd University Hospital, over a period from January 2017 to March 2018.

Inclusion criteria

Patients over the age of 18, followed in the service during the study period for a diabetic pregnancy, with type 1 or 2 diabetes, or gestational diabetes (T1D, T2D, GD).

The GD was revealed by a fasting blood glucose $> 0.92\text{g/l}$, or a positive induced oral hyperglycemia discovered between 24-28 weeks of amenorrhea, with at least one of the three values returned positive: $T0 > 0.92\text{g/l}$, $T2 > 1.80\text{g/l}$ or $T2 \geq 1.53\text{g/l}$.

Exclusion criteria

Patients with a history of psychiatric disease.

The variables studied

- Social and demographic features:
 - Age and gender.
 - Gesture and parity.
 - Education level.
 - Socio-economic status and health insurance (spouse's profession)
- Medical History:
 - Personal history, history of maternal or fetal complications during previous pregnancies, history of couple infertility, family history.
- Characteristics of diabetes
 - Duration of diabetes, treatment regimen.
 - Gestational age and how diabetes was discovered in patients with GD.
 - The level of glycemic control was evaluated by the determination of glycosylated hemoglobin (HbA1c) with standardized method HPLC in preconceptional phase and by the capillary glycemic monitoring during pregnancy.
 - The search for degenerative complications was made by clinical examination, exploration of renal function and 24-hour microalbuminuria and fundus examination. The search of other cardiovascular risk factors: high blood pressure, dyslipidemia and obesity.
- Pregnancy programming, type of contraception used.
- The degree of motivation and desire for pregnancy.

The search for anxiety and depressive disorders and the evaluation of their severity

Have been performed using the Hamilton anxiety scale and the Beck depression scale in their translated and validated arabic versions.

Hamilton anxiety scale or HARS (1959): It is one of the first scales of assessment using reliable and validated instruments to measure the severity of anxiety symptoms, and is still widely used today. It is applicable to adults and elderly subject. It includes 14 items scored according to the severity of symptoms (0 to 4): anxious mood (worry, apprehension, irritability); feelings of tension, tiredness, inability to relax, startle reactions, crying, tremors, fears; sleep disturbances: insomnia, night awakenings, tiredness, dreams, nightmares; concentrating difficulties and memory impairment; depressed mood; somatic symptoms (muscular, sensory, cardiac, respiratory, gastrointestinal, genitourinary or others).

Symptoms are scored from 0 to 4, based on general recommendations provided to distinguish degrees of severity (0 = no symptoms; 1 = mild, occurs irregularly and short periods; 2 = moderate, occurs more constantly and over longer periods, requiring considerable effort to cope with it; 3 = severe, continuous and dominates the life of the patient; 4 = very severe, disabling) [3,4]. The HARS scale assesses both psychological anxiety (mental restlessness and psychological distress) and somatic anxiety (physical complaints related to anxiety), rather than a single specific symptom.

The results of the evaluation can be interpreted as follows. A score of less or equal to 17 indicates mild anxiety. A score of 18 to 24 indicates mild to moderate anxiety. Finally, a score of 25 to 30 indicates moderate to severe anxiety [3].

The Beck Depression Inventory (BDI) was created in 1961 by Aaron T. Beck, a pioneer in cognitive therapy, for the sole purpose of determining the severity and intensity of symptoms of depression. The Beck Depression Inventory, is a validated instrument which contributes to the diagnosis of depression, thanks to the recent revisions of which it has been the subject, and which more closely resemble to the diagnostic criteria of depression [5].

It is used in subjects aged 13 and over. It assesses the symptoms of depression in terms of severity, on a scale of 0 to 3 based, on 21 specific items. Patients who approve several elements of the questionnaire (sadness, pessimism, past failure, loss of pleasure, feelings of guilt, fear of punishment, self-aversion, etc.), generally have higher scores with a maximum score of 63 compared to the others. For the general population, a score of 21 or more is associated with depression, while for people diagnosed clinically, a score of 0 to 9 represents minimal depressive symptoms, a score between 10 and 16 indicates mild depression, a score of 17 to 29 indicate moderate depression, while a score of 30 to 63 indicates severe depression [6].

The statistical analysis was done by SPSS software (version 17.0). The analytical study was carried out by the Pearson Chi-square test, with a significant P lower than 0.005.

Results

The study included 100 patients with an average age of 31.8 years (18-38 years). 32% had gestational diabetes (GD), 68% had pre-gestational diabetes: 46% had T2D and 22% had T1D.

19% of our patients were on diet only, of which 65% had a GD. 81% were on insulin therapy.

For the duration of diabetes: 52% had recent diabetes (less than 1 year), of which 55% had a GD. A duration of diabetes of more than 15 years, have concerned for the majority of cases, the T1D (11%).

The average glycemic control of our patients was insufficient: 8.5% of HbA1C. We attributed the causality, to the absence of pregnancy programming in 92.7% of our patients, who had consulted only at the discovery of pregnancy.

Regarding the degenerative complications of diabetes: 19% reported acute complications such as severe hypoglycaemia and

episodes of ketosis. These mainly concerned T1D patients (85%). Chronic complications concerned 25% of our patients: Diabetic retinopathy minimal (22%), moderate (13%), severe (6%). Nephropathy have concerned T1D patients: 2% in stage 5 and 9% in stage 4. There was no case of coronary artery disease, apart from a mitral valvulopathy of rhumatic origin in a T2D patient.

65% of our patients had a low socioeconomic level, with a monthly income less than 2000Dirhams per month, and 25% had no health insurance.

17% were illiterate and 26% had a school level not exceeding the primary school. Pregnancy was unwanted in 21% of our patients.

The history of maternal and fetal complications of pregnancy, have concerned 36% of our patients: miscarriages (25%), Pregnancy hypertension (40%), Preeclampsia (26%), premature birth (16%), acute fetal distress or need for intensive care (23%), stillbirth (10%) (Table 1).

Characteristics of patients	Group with mild to moderate depression N = 21%	Group with moderate to severe depression N = 9%	Group without depression N = 70	P
Age (years)	30,4	29,2	32,9	0,213
Type of diabetes				
• GD	2	0	33	0,003
• Type 2	9	0	20	
• Type 1	10	9	17	
Seniority				
<1 year	2	0	4	0,075
1-5years	3	0	10	
5-10years	1	1	17	
10-15years	3	2	13	
15-20years	8	3	10	
>20years	4	3	16	
Average glycemic control: HBA1C (%)	8,8	8,3	8,21	0,113
Pregnancy programming (%)	0	0		0,161
Desired pregnancy (%)	8	2	52	
Undesired pregnancy (%)	13	7	18	
Socioeconomic level (%)				0,089
• Low	13	5	60	
• Average	8	4	10	
• High	0	0	0	
School level (%)				
• Illiterate	4	5	26	
• Elementary	17	4	43	
• Secondary	0	0	7	
• University	0	0	0	
Traitement (%)				0,078
• Diet only	9	0	14	
• Insulintherapy	12	9	56	
Acute complications				
• Yes	13	9	16	
• No	10	0	54	
Chronic complications				0,312
• Yes	10	9	27	
• No	11	0	33	
History of maternal or fetal complications of pregnancy				0,675
• Yes	9	7	40	
• No	13	2	30	

Table 1: Clinical features of patients with depression.

The results of our study showed that anxiety was present in 65% of our patients (Figure 1), depression was found in 30% (Figure2). Depression was significantly associated with Type 1 diabetes ($p < 0.001$) (Table 1). Anxiety was significantly associated with GD, low socioeconomic level, history of pregnancy complications, and insulin therapy ($p < 0.001$) (Table 2).

Discussion

Pregnancy alone, is a high-risk condition for the onset of anxiety disorders, with a slightly more marked continuity than for depressive disorders, between pre- and postpartum, which is often a period of worsening of preexisting disorders. However, studies are rare, and their results for many, remain to be confirmed on larger samples [7].

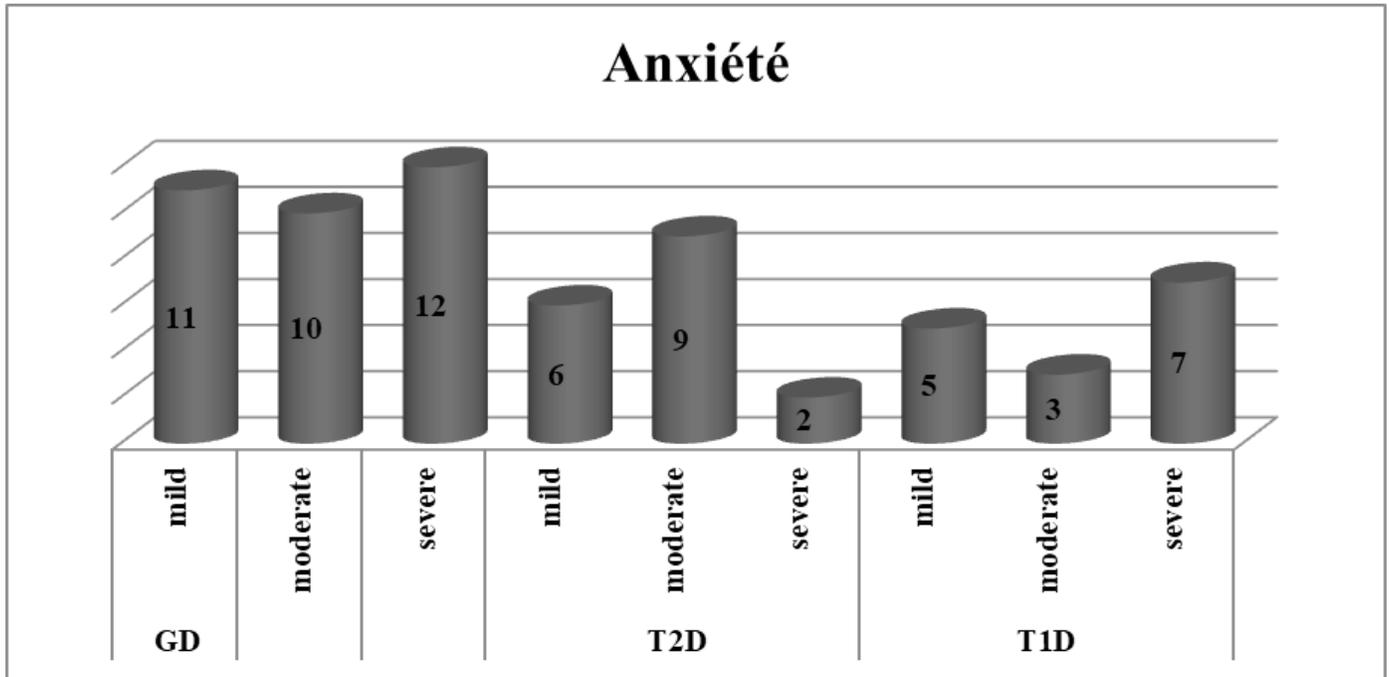


Figure 1: Prevalence of anxiety in our patients.

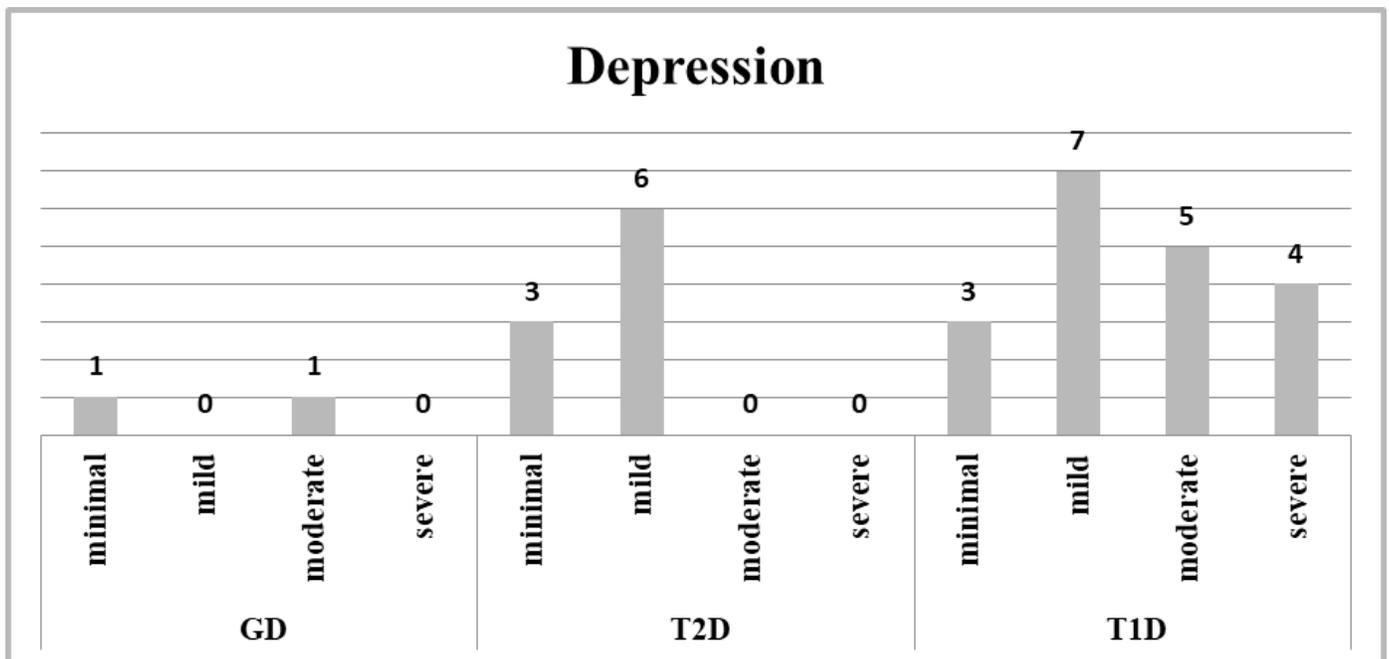


Figure 2: Prevalence of depression in our patients.

Characteristics of parturients	Group with mild to moderate anxiety N=22 %	Group with moderate to severe anxiety N=43 %	Group without anxiety N=5	P
Age (years)	30,1	31,2	32,9	
Type of diabetes • GD • Type 2 • Type 1	11 6 5	22 11 10	0 3 2	0,005
Seniority <1 years 1-5years 5-10years 10-15years 15-20years >20years	3 3 6 9 4 6	1 5 8 4 6 10	0 2 3 0 0 0	0,113
Average glycemic control : HBA1C (%)	8,2	8,7	7,75	0,078
Pregnancy programming (%) Desired pregnancy (%) Undesired pregnancy (%)	0 25 10	0 22 8	5 0	
Socioeconomic level (%) • Low • Average • High School level (%) • Illiterate • Elementary • Secondary • University	24 3 0 15 23 3 0	36 2 0 10 17 3 0	0 5 0 1 3 1 0	0,005 0,093
Traitement (%) • Diet only • Insulintherapy	7 12	6 40	1 4	0,003
Acute complications • Yes • No Chronic complications • Yes • No	4 30 10 18	10 21 15 12	2 3 2 3	0,002
History of maternal or fetal complications of pregnancy • Yes • No	12 15	28 10	0 5	0,005

Table 2: Characteristics of patients with anxiety

Four anxiety disorders have been more particularly studied: obsessive compulsive disorder (OCD), panic disorder, generalized anxiety and stress syndromes (acute and post traumatic). The use of questionnaires establishing a "pathological" threshold, indicates an approximately similar proportion of anxious women, in pre- and postnatal periods, with a strong correlation between the pre- and postnatal scores. Finally, anxiety symptoms are an excellent indicator of the occurrence of postnatal depressive disorders. When they appear at the end of pregnancy, accompanied by behavioral disturbances, mood swings or significant sleep disturbances, they should raise fears of a "puerperal psychotic" episode in subjects with bipolar disorder or a history of puerperal psychosis [8].

Pregnancy depression remains defined by international classifications, distinguishing between major and minor depression, the prevalence of which is estimated between 2 and 6% for the former, and between 5 and 12% for the latter [9,10]. The use of self-assessment questionnaires, unlike clinical interviews, tends

at the thresholds usually used, to overestimate the frequency of depressive symptoms, particularly during pregnancy [8].

The risk factors are similar to those of postnatal depression. We will underline the correlations more specifically found with primiparity and a history of obstetric accidents or abortion, personal history of depression and negative feelings or ambivalence related to the current pregnancy. Recent studies have highlighted significant correlations between prenatal depression and risky maternal behaviors such as smoking, alcohol or drug use, with a poor medical monitoring of pregnancy [11,12] as well as with several obstetrics complications [13] including premature delivery [14,15] with an adjusted odds ratio of around 2. These latter results are not constantly found [16,17]. Less follow-up of pregnancy in depressed populations, especially in disadvantaged areas [18], or the existence of concomitant addictions, as well as the method of assessing depression, could contribute to these discrepancies. In addition, the direction of the causal relationship remains uncertain:

the apprehension of a real risk for the child (screening for Down's syndrome, anomalies during follow-up, unfavorable history, etc.) can also lead to an impairment of the mood or anxious manifestations.

Thus, pregnancy constitutes a special period for women, characterized by a state of physical and mental vulnerability. This condition is more delicate, when the diagnosis of diabetes is added, with the potential risks for the mother and the fetus, thus negatively affecting the quality of life (Quality of life or QoL) in these patients [19,20].

According to recent studies, QoL is a clinical concept allowing a subjective assessment of an individual's state of health, it is found to be significantly compromised, in the short and long term, in women whose pregnancies is complicated with diabetes [21].

The most recent meta-analysis, carried out in order to specify the prevalence of depressive disorders in diabetic subjects, was achieved by Anderson et al. in 2001 [22]. It concerned 42 studies: The author reported that the average prevalence of depression in diabetic subjects was 11%, for studies using a hetero-assessment of depressive symptoms, and 31% for studies using self-assessment scales. He also found that the presence of diabetes doubled the risk of developing depression, regardless of the type of diabetes, gender and method of assessing depression.

A Moroccan study which have concerned 187 diabetic patients, demonstrated that 41.2% were suffering from a major depressive episode, 27.8% have dysthymia, while 21.9% have double depression [23]. The diagnosis of depressive disorders was made by the Mini International Neuropsychiatric Interview (MINI) and their severity assessed by the Hamilton depression scale (HAMD).

Our study demonstrated a high incidence of anxiety and depressive disorders in pregnant diabetic women, especially in gestational diabetes, or in type 1 diabetic patients who are at higher risk for depression and major anxiety disorders. GD is defined by the discovery of previously unknown diabetes during the 2nd or 3rd trimester of pregnancy [24]. It is one of the most common metabolic diseases during pregnancy and affects approximately 7% of cases [24,25]. It affects not only the glycemic balance in these patients but also mental health with a negative impact on the psychological well-being and quality of life [26,27].

The same results were found in a study conducted at the maternity unit, of the University hospital of Ibn Rochd in Casablanca, whose objective was to estimate the prevalence of depression and anxiety at the end of pregnancy in 150 Moroccan pregnant women, and which highlighted a prenatal depression rate of 20.7% and an anxiety rate of 44%. Single women, those with a psychiatric history and those with undesired pregnancies had higher prevalence of prenatal depression according to the study [2].

Conclusion

Diabetes associated with anxiety and depressive disorders, is a public health problem, due to their prevalence and cost. Data shows that diabetes doubles the risk of developing depression and anxiety.

Our study has identified a high prevalence of the anxiety and depressive disorders, within our pregnant women suffering from diabetes. These disorders have been associated with many factors such as: the recent discovery of diabetes in the case of GD, T1D, patients with a history of maternal or fetal complications of pregnancy, and the low socioeconomic status.

The literature insists on the importance of the recognition and early treatment for these disorders both from a psychiatric point of view, and for an optimal management of the metabolic disease itself, since the existence of a depressed state in a diabetic patient, is associated with poorer glycemic control, consequently a greater risk of complications, hence the need for screening and management of these disorders during medical prenatal consultations.

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