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Study of Co-Morbid Depression and Glycemic Control in Type 2 Diabetes Mellitus

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Abstract

Background: Diabetes increases the risk of co morbid depression almost twice which increases diabetic complications leading to poor metabolic control and decreased quality of life. Depression exacerbates the progression of diabetes and hence screening and treatment of depression in diabetic individuals helps in improving the glycemic control and quality of life. *Aims and objectives:* Aim of this study is to determine the effects of metabolic control on depression and health related quality of life. *Materials and Methods:* Case-control study design with 110 diabetic individual more than 5 years duration and 110 good controlled diabetic individuals. Glycemic index (HbA_1C) is used for evaluating metabolic control. Hamilton's scale of depression and anxiety is applied along with hospital anxiety and depression scale {HADS}. Unpairedstudent 't' test is used to find the significance of values between the cases and controls. *Results:* The mean Hamilton's scoring for cases is 22.11±6.68 and for controls is 2.45±4.32. The difference is significant at $p<0.05$. The mean HADS score for cases is 11.51±4.5and for controls is 1.58±1.92. Its significant at $p<0.05$. *Conclusion:* This study found that the diabetes with poor glycemic control has more risk of co morbid depression and poor quality of life when compared togood glycemic controlled diabetics.

Keywords: Depression; Diabetes Mellitus; Glycaemic Index.

Introduction

Diabetes and depression are major disorders which affects the quality of life [1,2]. Individuals with chronic disease like diabetes mellitus (DM) usually coexist with anxiety and depression [1,2]. According to Centers for Disease Control and Prevention (2011), in adults 90% to 95% of newly diagnosed cases are type 2 diabetes [3,4]. Individuals with diabetes are more vulnerable to depression than individuals without diabetes [1-3].

Almost 20% of the uncontrolled hyperglycemic diabetic patients are suffering from depression [5,6]. Some studies showed the range for depression in diabetic individuals as 24% to 30% [2,7,8]. Some studies show that 15–24% of type 2 diabetes are prone for depression [7,8]. Longer the duration of diabetes higher the risk of depression [9]. Diabetic individuals with high HbA1c (Glycated Haemoglobin) levels have lower quality of life [9]. Women are affected more than men. Adolescents suffering from DM and depression have a higher incidence (10 fold) of suicidal ideations. Uncontrolled hyperglycemia causes great emotional, physiological and social problems in patients [10]. Hence, screening and treatment of depression in diabetic individuals helps in improving the glycemic control and quality of life.

Aim

The aim of this study was to assess the metabolic control (HbA_1C) and prevalence of anxiety and depression in diabetic using standardized rating scales of anxiety and depression.

Materials and Methods

It is a Hospital based case control study. Study was done in Sri ManakulaVinayagar Medical college hospital, Madagadipet, Puducherry.

Sample Size: 220 diabetic individuals

Case -110 poorly controlled diabetic individuals.

Control- 110 well controlled diabetic individuals.

In 110 diagnosed diabetic patients,

They were assessed for

1. Sociodemographic profile,
2. Duration of illness and HbA_1C,
3. Hamilton rating scale for depression (HDRS),
4. Hamilton rating scale for anxiety (HARS) and
5. Hospital anxiety depression scale (HADS).

Inclusion Criteria

Diabetic individuals of more than 5 years duration

Patients of both the sexes were taken

Exclusion Criteria

Presence of any organic illness.

Any other major psychiatric illness, like schizophrenia and mental retardation.

Patient already on any psychotropic drug.

Results

Tables 1 and 2 show the sample population with gender distribution. Results (Table 3) show that many cases were in the mild category by HARS scale. There were significant differences in anxiety and stress levels (Table 4) between the controlled and uncontrolled diabetes groups. These correlate with HBA1C levels (Table 5) and comorbid depression.

Table 1: Age and gender distribution of sample population

Age in years	Male		Female	
	Case	Control	Case	Control
<30	6(12)	4(8)	4(6.66)	6(10)
31-50	16(32)	18(36)	20(36.66)	20(33.33)
>50	28(56)	28(56)	36(56.66)	34(56.66)
Total	50	50	60	60

Figures in parentheses indicate percentage

Table 2: Depression and gender distribution

	Male	Female	Total
>8 no depression	8 (15.38)	8(13.79)	16(14.54)
8-13 mild depression	14 (26.92)	10 (17.34)	24(21.81)
14-18 moderate depression	8 (15.38)	20 (34.48)	28(25.45)
19-22 severe depression	10 (19.32)	12 (20.68)	22(2)
23 and >23 very severe depression	12 (23.07)	8(13.79)	20(18.18)
	52	58	110

Figures in parentheses indicate percentage

Table 3: Hamilton Anxiety Rating Scale

HARS	Male	Female	Total
<17 mild	38(76)	36(6)	74(67.27)
18-24 moderate	6(12)	14(23.33)	20(18.18)
25 severe	6(12)	10(16.66)	16(14.54)
Total	50	60	110

Figures in parentheses indicate percentage

Table 4: Student't' Test

	Type	Mean	Std. Deviation	Significance
H scale D	Case	20.57	8.386	.012
	Control	2.19	4.010	.031
H scale A	Case	20.71	7.742	.002
	Control	2.09	4.166	.005
HADS	Case	10.66	5.128	.025
	Control	1.39	1.671	.017

Student 't' Test

Table 5: Correlation of Glycated Haemoglobin and Depression

		HbA1C	H scale D	H scale A	HADS	Duration
HbA1C	Pearson Correlation	1	.757**	.750**	.686**	.560**
	Sig. (2-tailed)		.000	.000	.000	.000

**Correlation significant at the 0.01 level (2-tailed)

Discussion

Depression and anxiety are most common psychiatric disorders worldwide. Individuals with diabetes mellitus usually coexist with anxiety and depression.People with diabetes suffer from depression at a higher level when compared to normal people. Both depression and diabetes are known to activate the hypothalamo-pitutary-adreno–cortical axis. Diabetes may enhance the risk of depression through increased sympatho – adrenal system activity or a dysregulation of the hypothalamic–pituitary axis. Moreover, biochemical changes related to depression such as hypercortisolemia, inflammation, and sympathetic nervous system activation mechanisms that impair insulin sensitivity and glucose metabolism may contribute to development of diabetes. Hyperglycemia causes great emotional, physiological and social problems in patients. Depression also exacerbates the progression of diabetes. Some direct relationship can be observed between mood/anxiety and glycemic control.

Conclusion

Only one-fourth of patients with depression were actually aware about their depressive status in this study. About 84% of the patients had comorbid depression and anxiety. This study found that the diabetes with poor glycemic control has more risk of co morbid depression and anxiety when compared to good glycemic controlled diabetics. There is direct relationship observed between mood/anxiety and glycemic control.

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