Brief Communication

# Comparison of complications in diabetic outpatients with or without mental illness

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## ABSTRACT

Diabetes Mellitus (DM) and psychiatric illness are related in many ways by prevalence, burden, course, and outcome. Co-morbid mental illness may play a role in determining the complication in diabetic patients. This study was conducted in 2010 among consecutive diabetic out-patients diagnosed as per American Diabetes Association (ADA) guidelines 2009, of age above 14 years, to compare the complications in diabetic patients with or without mental illness. Diabetic neuropathies, cardiovascular complications, and morbid obesity were among the complications significantly more among diabetic patients with mental illness (GHQ-12 ≥ 2) than without mental illness (GHQ-12 ≤ 2).

**Key words:** B. P. Koirala Institute of Health Sciences, complications, diabetes mellitus, mental illness, outpatient clinic

## Introduction

Diabetes Mellitus (DM) is one of the most common chronic diseases, with an overall prevalence of approximately 2%.[1] International Diabetes Federation (IDF) has estimated that around 200 million people have diabetes, and by 2025, it is expected to increase to 333 million and to double by 2030.[2] Untreated DM causes much morbidity and mortality due to its devastating late complications involving micro-vascular and macro-vascular structures.[3]

Diabetes is one of the most psychologically demanding chronic medical illnesses. Both community and clinical studies show higher prevalence of mental illness among diabetic patients.[4] This study project was conducted in the Nepalese context of limited data on this aspect with the objective to examine if the presence of mental illness makes a difference in diabetic complication.

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| Quick Response Code: | Website: www.ijem.in |
| | DOI: 10.4103/2230-8210.119643 |

## Materials and Methods

A hospital-based cross sectional comparison study was conducted among consecutive diabetic out-patients age 14 years giving informed written consent from January 2010 to January 2011 in Medicine Outpatients at B. P. Koirala Institute of Health Sciences (BPKIHS). Those patients with gestational and secondary diabetes and those not giving the consent were excluded. A thorough physical examination and blood investigations were done to fulfill the American Diabetes Association (ADA) criteria for DM in all subjects. Diabetes was diagnosed as per the ADA guidelines 2009[5] which are as follows:

1. Fasting Plasma Glucose (FPG) ≥126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h*
   OR
2. Symptoms of hyperglycemia and a casual (random) plasma glucose (RBS) ≥200 mg/dl (11.1 mmol/l). Casual (random) is defined as any time of day without regard to time since last meal. The classic symptoms of hyperglycemia include polyuria, polydipsia, and unexplained weight loss
   OR
3. 2-h plasma glucose (post-prandial plasma glucose PP) ≥200 mg/dl (11.1 mmol/l) during an oral glucose

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tolerance test (OGTT). The test should be performed as described by the World Health Organization using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.*

*In the absence of unequivocal hyperglycemia, these criteria should be confirmed by repeat testing on a different day.

Every patient blood sample were collected for FPG, RBS, post parandial blood sugar (PPBS), serum urea, and creatinine, routine urine examination, lipid profile [Total cholesterol, High-density lipoprotein (HDL), Triglycerides, low-density lipoprotein (LDL), very-low-density lipoprotein (VLDL)], serum sodium and potassium, electrocardiography (ECG), and chest X-ray. Glycosylated hemoglobin (HbA1c) was done with NYCO CARD READER II fully automated HbA1c analyzer system. The macro-vascular complications like ischemic heart disease, peripheral vascular disease, and micro-vascular complications like diabetic retinopathy, diabetic neuropathy, and diabetic nephropathy were searched and diagnosed clinically by investigator/physician and with the use of relevant investigations.

All participants responded to standard self-response questionnaire-'General health questionnaire' (GHQ-12),[6] which categorized the responders as 'caseness' for those with some problem scoring 2 and above. Upon an independent psychiatric assessment, the individuals exceeding the threshold and categorized as the 'case' would be more likely than not (0.51) to have a psychiatric diagnosis.[6]

The complications were statistically compared between the diabetic patients with and without 'psychiatric caseness' by Chi-square test using Statistical Package for Social Sciences (SPSS) 10 version.

## Results

Among total enrolled 200 subjects, 101 (50.5%) were male and 99 (49.5%) female, with M:F ratio of 1.02:1. Average age was 55 (22 minimum, 92 maximum) years. Patients of age group (>60 years) constituted the largest proportion 77 (38.5%). Majority of the cases had visited the clinic within 10 years of onset of DM. Average duration was 6.9 (newly married-38) years.

When body mass index (BMI) ≥23 kg/m$^2$ (as recommended for Asians)[7] were taken as the determining factor for overweight, 28.5% of patients were overweight, 18.5% obese, and 50% morbid obese. 69.5% of type 2 DM had pre-hypertension followed by 17.17% and 8.08% of stage I and stage II hypertension, respectively.

The most common and frequent chronic complications were retinopathy (Nonproliferative Diabetic Retinopathy (NPDR)-26.5% and Proliferative diabetic retinopathy (PDR)-5.5%), neuropathy (24.5%) followed by cardiovascular (13.5%), nephropathy (microalbuminuria-5% and macroalbuminuria-3.5%), and others (21.5%) [Figure 1].

Diabetic neuropathies, cardiovascular complications, and morbid obesity were among complications clearly more among diabetic patients with GHQ-12 ≥2 than GHQ-12 ≤2 [Table 1].

## Discussion

Diabetes mellitus is a common but preventable metabolic disorder. The macro as well as micro-vascular complications of diabetes mellitus had statistically significant association with duration of disease and poor glycemic control.[8]

We found 101 males and one female in our study. (101 M: 99 F). 38.5% subjects were older than 60 years which was similar to study from rural north India showing psychiatric morbidity higher in the elderly (43.32%) when compared to those below the age of 60.[9]

In our study, diabetic complications like retinopathy, neuropathy, and cardiovascular were higher than the Indian results.[10] These high figures of retinopathy could be attributed to lack of awareness in our patients to undertake regular eye examination and neuropathy could be due to insidious onset and slow progress. So, we recommend screening of high risk groups and emphasize the importance of early diagnosis of diabetes and detection of chronic complications so that appropriate treatment can be initiated at the earliest.

Lustman *et al.*,[11] reported that the lifetime prevalence of

**Table 1: Comparison of diabetes complications among patients with mental illness**

| Complications | GHQ-12 ≤2 | GHQ-12 ≥2 | *P* value |
|---|---|---|---|
| Neuropathy | 10 | 39 | 0.032 |
| NPDR | 12 | 45 | 0.539 |
| PDR | 8 | 21 | 0.28 |
| Microalbuminuria | 3 | 7 | 0.597 |
| Macroalbuminuria | 2 | 5 | 0.60 |
| Cardiovascular | 7 | 20 | 0.048 |
| Stroke | 8 | 15 | 0.59 |
| PvD | 2 | 7 | 0.407 |
| Diabetic foot | 1 | 8 | 0.157 |
| GIT | 1 | 2 | 0.688 |
| Dermatologic | 3 | 4 | 0.465 |
| Sexual | 2 | 5 | 0.398 |
| Underweight | 10 | 47 | 0.456 |
| Overweight | 12 | 25 | 0.367 |
| Obese | 41 | 59 | 0.02 |

NPDR: Nonproliferative diabetic retinopathy, PDR: Proliferative diabetic retinopathy, PVD: Peripheral vascular disease, GIT: Gastrointestinal tract

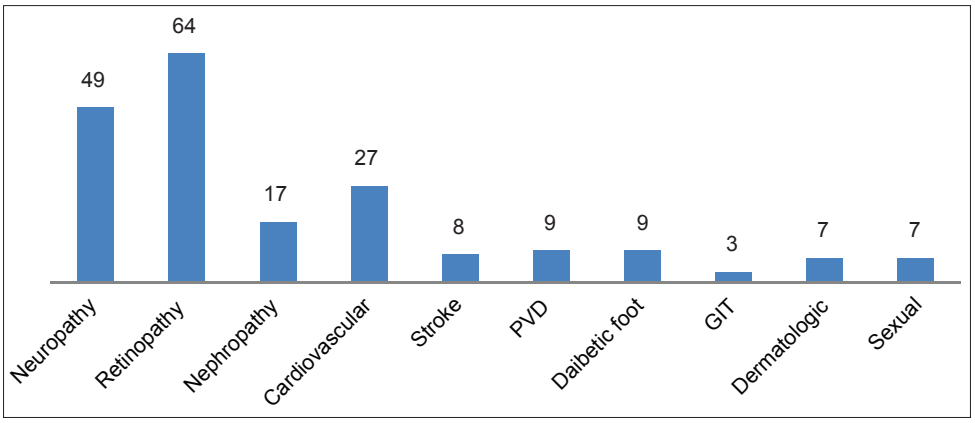


**Figure 1:** Diabetic outpatients with chronic complications

psychiatric disorders is higher in diabetic patients with inadequate metabolic control. (We used the GHQ-12 as a screening tool for detecting possible mental illness in terms of 'psychiatric caseness', which has been used for this purpose in Nepal as well and is a valid instrument that divides the subject population into those with mental illness/'psychiatric caseness' and those without which makes achievement of our objective possible). We had 68% of diabetic subjects with GHQ 12 score more than 2.[12]

## Limitations

As we clearly mentioned in the text, we mean to study over all mental illness; rather than a specific like depression in this study. Studies with specific psychiatric disorders is definitely a good idea and would be further step ahead for us which are, however, beyond the scope of this project with limited resource. We believe data procured with this project opens the avenues for many such avenues a head.

Since our study was set to see overall effect of overall mental illness or psychiatric disorder on diabetic complication, we did not intend to study specifically into the effect of psychotropic with limited resource for our context and we acknowledge as the limitation of this project which could be other area of study.

The combination of DM and mental illness is important because it is associated with worse outcomes compared to having diabetes alone.[13,14] Our study showed that individuals with mental illness were at an increased risk of clinically significant neuropathies and cardiovascular complications than without mental illness.

## Conclusions

Diabetic neuropathies, cardiovascular complications, and morbid obesity were among the complications significantly more among diabetic patients with mental illness (GHQ-12 $\geq$ 2) than without mental illness (GHQ-12 $\leq$ 2).

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**Cite this article as:** Maskey R, Shakya DR, Sharma SK, Karki P, Lavaju P, Baranwal JK. Comparison of complications in diabetic outpatients with or without mental illness. Indian J Endocr Metab 2013;17:S313-5.

**Source of Support:** BPKIHS Annual Reserach Grant,
**Conflict of Interest:** None declared.