A study on the prevalence of depression in a Chennai based diabetic population

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INTRODUCTION

In addition to being risk factors for cognitive decline, studies show that diabetes and depression are independent risk factors for each other. Evidence shows comorbid depression in diabetes is associated with lower adherence to self-care behaviours such as diet, physical activity, use of medication, and glucose monitoring, as well as poor glycaemic control, and microvascular and macrovascular complications.1 Depression and diabetes frequently co-occur; the presence of depression increases the risk of future diabetes and diabetes increases the risk of subsequent depression. Moreover, the comorbidity of depression and diabetes has been found to be particularly harmful in terms of cardiovascular events, cardiac mortality and mortality in general.2 Depression is potentially modifiable, and its treatment might translate into a decreased risk of diabetes onset. This is theoretically plausible as the typical age of onset of depression is considerably lower than the typical age of diabetes onset.2 The likelihood of depression in type 2 diabetes mellitus (T2DM) is approximately double that found in the general population.3 It has been proposed that depressive symptoms act as mediators of subsequent
metabolic disruptions due to their effects on activity levels and other health behaviors. Recent studies suggest that duration of diabetes may be an important factor in the temporal trend of depressive symptoms at the population level, likely due to the development and severity of diabetes-related distress and frailty. Depression heightens the psychological impact of diagnosis of diabetes, resulting in increased diabetes-related stress. Relationship between DM and depression has been investigated by many researchers. Prevalence of depression among individuals with DM appears to vary by type of DM, race/ethnicity, and among developed and developing nations. Therefore, screening for depression among diabetic patients is important in different races and ethnicities. Hence a study was taken up with the objectives of estimating the prevalence of depression among the adult diabetic population and also to identify certain risk factors that may be associated with them.

**METHODS**

**Study design**

The study was done as a Community based Cross-sectional study, with both descriptive and analytical components. The descriptive component was used to estimate the prevalence of depression in a diabetic population and the analytical component was used to find the factors associated with them.

**Study period**

August 1st to September 30th 2015

**Study setting and subjects**

The study was done on adult (>18 years) diabetics residing in the rural and urban field practice areas of A.C.S. Medical College. The rural area comprised of Pariavakkam, Pidarithangal and Kolapancherry villages and urban area comprised of Adayalempet, Chinna – nolambur and Erikkarai areas.

**Selection and distribution of participants**

Three hundred (300) Adults with a known history of diabetes and who were willing to participate in the study were selected by stratified random sampling from the study areas. Only one diabetic was selected from each family and equal number of samples were studied from the rural and urban areas (150 each)

**Sample size and sampling unit**

Based on literature review the prevalence of depression was found to be 40.2% in a Palestinian population. With an allowable error of 14% of the prevalence which was 5.63. The minimum sample size to be studied was calculated to be 291 finally it was decided to study a sample of 300.

**Ethical considerations**

Ethical clearance was obtained from the institutional ethics committee of A.C.S. Medical College and informed consent was also taken from all the study subjects before the start of the study.

**Definition and classification of main study variable**

Depression: A widely used 9 item patient health questionnaire was used to estimate the prevalence of depression. Subjects having scores of 5 and above were suffering from depression.

Obesity: subjects having a BMI >25 were considered as obese and those having a B.M.I of ≤25 was considered as non – obese.

Socio–economic status: Subjects were classified into five classes based on modified B.G. Prasad Classification 2014.

**Data analysis**

The data entry and analysis were done using statistical package for social sciences (SPSS) version 22. The final data was summarized into percentages and 95% CI was calculated for the prevalence rates. Cross tabulations for various variables. Chi-square values were calculated wherever appropriate and p values were based on the 2 – tailed values. Associations were assessed, and 95% confidence interval of odds ratios were found using Epi Info version 7.1.2.

**RESULTS**

**Socio-demographic profile**

Of the participants, 50% were from rural and 50% from urban communities. Among the participants, 30.7% were males and 69.3% were females. Majority of them were on a mixed diet i.e. 93.3%. Of the study subjects 23.7% were employed and 76.3% were unemployed. Details can be seen in Table 1. Among the participants highest number of subjects (28.7%) were from class II of B.G.Prasad classification. Details can be seen in Figure 1.

**Prevalence of depression in a diabetic population**

Of the 300 diabetics, 129 had a PHQ-9 score of >4. The overall prevalence of depression among diabetics was found to be 43% with a 95% CI of 37.4 to 48.6. Details can be seen in Table 2.

**Association between treatment depression in diabetes and certain suspected risk factors**

Depression in diabetics was more seen with unemployment, BMI ≤25, lower socio-economic status (class 3, 4, 5 of B.G Prasad classification), joint families,
subjects who had quoted that diabetes had an impact on their work life and personal life. All the above-mentioned associations were also found to be statistically significant, however the other associations were not statistically significant. Details can be seen in Table 3.

Table 1: Socio–demographic profile of the study subjects.

| Variables                  | Number (out of 300) | Percentage (%) |
|---------------------------|---------------------|----------------|
| Age (years)               |                     |                |
| ≤55                       | 143                 | 47.7           |
| >55                       | 157                 | 52.3           |
| Gender                    |                     |                |
| Male                      | 92                  | 30.7           |
| Female                    | 208                 | 69.3           |
| Employment status         |                     |                |
| Employed                  | 71                  | 23.7           |
| Unemployed                | 229                 | 76.3           |
| Type of diet              |                     |                |
| Vegetarian                | 20                  | 6.7            |
| Mixed                     | 280                 | 93.3           |
| Type of family            |                     |                |
| Nuclear                   | 140                 | 46.7           |
| Joint                     | 160                 | 53.3           |
| Type of house             |                     |                |
| Pucca                     | 213                 | 71             |
| Semi–pucca                | 69                  | 23             |
| Khutcha                   | 18                  | 6              |

Table 2: Prevalence of depression in a diabetic population.

| Variable                       | Number of diabetics with the attribute (out of 300) | Percentage (%) | 95% C. I    |
|--------------------------------|--------------------------------------------------------|----------------|-------------|
| Depression (>4 in PHQ -9 questionnaire) | 129                                                     | 43             | 37.4 to 48.6|

Table 3: Association between depression in DM and certain suspected risk factors.

| Variable                      | Classification of variable (number of people in the group out of 300) | Number of diabetics with depression (out of 129) | Odds ratio (95% C.I of odds ratio) | Chi-square value | P-value |
|--------------------------------|------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------|------------------|---------|
| Employment                     | Unemployed (229)                                                        | 106                                              | 1.8 (1.03-3.15)                  | 4.25             | 0.038 * |
|                                | Employed (71)                                                          | 23                                               | 1.00                             |                  |         |
| Obesity                        | BMI ≤25 (125)                                                          | 64                                               | 1.78 (1.11-2.83)                 | 5.86             | 0.015 * |
|                                | BMI >25 (175)                                                          | 65                                               | 1.00                             |                  |         |
| Socio-economic status          | Low (class 3,4 & 5) (169)                                              | 82                                               | 1.68 (1.06-2.69)                 | 4.80             | 0.029*  |
|                                | High (class 1 & 2) (131)                                               | 47                                               | 1.00                             |                  |         |
| Family                         | Joint (160)                                                            | 79                                               | 1.76 (1.10-2.79)                 | 5.67             | 0.017*  |
|                                | Nuclear (140)                                                          | 50                                               | 1.00                             |                  |         |
| Diabetes impacts work life     | Affected (67)                                                          | 38                                               | 2.04 (1.8-3.55)                  | 6.6              | 0.01*   |
|                                | Not affected (233)                                                     | 91                                               | 1.00                             |                  |         |
| Diabetes impacts personal life | Affected (80)                                                          | 53                                               | 3.72 (2.17-6.38)                 | 23.98            | 0.000097|
|                                | Not affected (220)                                                     | 76                                               | 1.00                             |                  |         |
| Awareness of diabetes as lifelong disease | Not Aware (46)                                                      | 24                                               | 1.55 (0.82-2.91)                 | 1.86             | 0.17    |
|                                | Aware (254)                                                            | 105                                              | 1.00                             |                  |         |
| Gender                         | Female (208)                                                           | 96                                               | 1.53 (0.92-2.54)                 | 2.74             | 0.098   |
|                                | Male (92)                                                              | 33                                               | 1.00                             |                  |         |
| Type of health care facility for management of DM | Government (119)                                                      | 57                                               | 1.39 (0.87-2.22)                 | 1.93             | 0.17    |
|                                | Private (181)                                                          | 72                                               | 1.00                             |                  |         |
Figure 1: Socio-economic status as per B.G. Prasad classification.

DISCUSSION

This community-based cross-sectional study on a diabetic population has not just been a tool to find the problem statement of depression but it has also given valuable insights into the various modifiable risk factors that might be playing a role in causing the same.

Overall prevalence of depression in diabetics is 43% with a 95% CI of 37.4-48.6% whereas a study done on diabetics in Washington University, USA shows the range of the prevalence of current depression obtained from structured diagnostic interviews in diabetic samples was 8.5-27.3% in controlled studies and 11.0-19.9% in uncontrolled studies this difference could be because of the significant differences in the population types that were studied. A study done in Palestine revealed that the prevalence of depression among the diabetic population was 40.2%, this was comparable to the findings of the current study. The current study revealed a statistically significant association between depression in diabetics and unemployment which was similar to the results of studies done on the general population. A study done in the US revealed that unemployment doubled the risk of having depression.

The limitations of the study are that a higher allowable error (14% of prevalence) than what is ideal was used to estimate the sample size as the study was done by interns during their posting in the department of Community Medicine and they had time constraints. Analytical cross-sectional studies are weak studies for determining causal associations. Further research is needed to corroborate the associations found in this study.

The prevalence of depression was also found to be quite high in the study population (43%). This calls for the betterment of mental health services including screening for depression which could be made mandatory at the primary health care level. These steps are to help prevent the complications of diabetes mellitus which are debilitating.

ACKNOWLEDGEMENTS

Our sincere thanks to the health workers and field staff of A.C.S Medical College, who worked tirelessly during the data collection phase of the study in accompanying the interns to the households of the diabetic subjects included in the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of A.C.S. Medical College

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Cite this article as: Paul CMP, Prithika UY, Nethaji VS, Vishnu S, Rumaiza W, Manoharan SS, et al. A study on the prevalence of depression in a Chennai based diabetic population. Int J Community Med Public Health 2018;5:5371-4.