Screening for the risk of diabetes among people aged 31 to 40 years using Indian’ diabetic risk score among people attending medicine out-patient department of a tertiary care hospital in Chennai

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Abstract

Context: With an estimated 8.7% of the diabetic population in the 20 and 70 age group, diabetes is a rising problem in India. It is important to screen for diabetes, so that the incidence of diabetes and its complications can be controlled. IDRS is a simple method useful for diabetes risk screening. Aim: To assess the risk of diabetes among people aged 31–40 years and to estimate the proportion of participants at high risk for developing diabetes. Setting and Design: Cross-sectional study done among the people attending medicine out-patient department of a tertiary care Hospital in Chennai. Methods: This study was conducted among 318 participants aged 31 to 40 years. Convenient sampling method was used. IDRS questionnaire was used to assess the risk of diabetes. Statistical Analysis Used: Data was entered in excel spreadsheet and analyzed using SPSS software version 16, statistical analysis will be done using Chi square test. Results: According to IDRS, 35.2% (112) had high risk for developing diabetes, 55% (175) had moderate risk and 9.7% (31) had low risk for developing diabetes. Those subjects with family history of diabetes, increased waist circumference and increased age were found to be associated with higher risk of developing diabetes. Conclusion: In this study, majority of the participants had moderate risk (55%) and high risk (35.2%) of developing diabetes. Thus, it is necessary to bring more awareness among the people and initiation of lifestyle changes to delay the onset of diabetes and its complications.

Keywords: Diabetes, IDRS, screening

Introduction

Diabetes is one of the major health problem which is increasingly found in the world’s population. Around 422 million people worldwide have diabetes, particularly in countries with low and medium incomes, and 1.6 million deaths are due to diabetes every year.[1] A combination of factors such as rapid urbanization, sedentary lifestyles, unhealthy diets, tobacco use, and rising life expectancy are driving the increase in diabetes prevalence.[2] As half the population in India with diabetes are undiagnosed, we use IDRS to screen for the risk of diabetes and prevent the incidence of diabetes in high-risk individuals.

Methodology

This cross-sectional study was done at medicine out-patient department of a tertiary care hospital in Chennai, India. People who were aged 31–40 years attending medicine out-patient department of a tertiary care hospital in Chennai and people who were willing to participate were included in the study. People who were already identified to be diabetic and pregnant women were excluded.

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excluded from the study. Informed consent was obtained from all the participants of the study. Study duration was about 3 months. Ethical clearance from Institutional ethics committee (IEC) clearance was applied for and obtained. Sample size was 318. Convenient sampling method was used. The participants were assured that participation was voluntary, and confidentiality would be maintained. Indian Diabetic Risk Score questionnaire developed by Madras Diabetic Research Foundation was used. The first part of the questionnaire covered the demographic details. The second part of the questionnaire included the IDRS which consisted of the age in years, abdominal obesity, physical exercise and family history of diabetes. According to IDRS, scores are calculated for each person. An IDRS score of ≥60 has high risk of developing diabetes, a score of 30-50 has moderate risk and <30 has a low risk of developing diabetes. After obtaining the data, it was entered in excel spreadsheet and analyzed using SPSS software version 16, statistical analysis will be done using Chi square test.

Results

The present study was conducted among patients attending Medicine out-patient department of a tertiary care hospital in Chennai. A total of 318 participants were included in this study. 25.4% (81) were male participants and 74.5% (237) were female participants. 28.4% (i.e., 23 out of 81) of the male participants and 37.6% (i.e., 89 out of 237) of the female participants were at a high risk of developing diabetes. Female participants were at higher risk than male participants.

In this study, 71% and 29% were living in urban and rural areas, respectively. Out of the participants living in urban area, 36.3% (i.e. 82 out of 220) had high risk and out of the total participants living in rural area, 32.6% (i.e. 30 out of 92) had high risk. According to modified B G Prasad socio-economic classification for 2019, 32.3% were belonging to upper class, 30.1% to upper middle class, 24.1% to middle class, 11% to lower middle class and 2.2% to lower class. 4.7% (15) of the total participants were illiterate, out of this 53.3% (i.e. 8 out of 15) of them had high risk for diabetes [Table 1]. Illiterate participants had higher risk for diabetes.

Among 318 participants whose data were analyzed, 35.2% (112) had IDRS ≥60 which is high risk for developing diabetes, 55% (175) had IDRS 30-50 which is moderate risk and 9.7% (31) had IDRS <30 which is low risk for developing diabetes [Chart 1].

From Table 2, there is a significant association between the type of work, education, type of family and the risk of diabetes in this study. With increase in the age of the participants, there is increase in the risk of developing diabetes. In the present study, 42.4% were <35 years of age and 57.5% were aged between 35 and 49 years. 55.7% (i.e. 102 out of 183) of the participants aged between 35 and 49 years came under high risk category, whereas only 7.4% (i.e. 10 out of 135) of the participants aged <35 years came under high risk category. Age wise distribution of participants is shown in Table 3.

Approximately 64% (i.e. 58 out of 91) of the women with waist circumference >90 cm and 43% (i.e. 9 out of 21) of the men with waist circumference >100 cm had high risk to develop diabetes. Around 55% (i.e. 45 out of 81) of the participants who did not do any exercises and had a sedentary work pattern were at a higher risk of developing diabetes. Out of the total participants, 53.4% (170) had no family history, 37.7% (120) had family history of either of their parent with diabetes and 8.8% (28) had family history of both their parents with diabetes. 75% (i.e. 21 out of 28) of the participants who had a family history of both the parent’s diabetic had a high risk of developing diabetes [Table 3].

Discussion

Majority of the people with diabetes are still undiagnosed. Nowadays due to dietary changes and other factors, even younger people are found to be diabetic. People aged 30 to 40 years are more prone to develop diabetes, so it is important to screen them and diagnose it in pre-diabetic stage itself. So as a physician it is important to screen and identify the high risk people and take necessary action to prevent diabetes at primary level. The findings of the present cross-sectional study show the participants with risk of developing diabetes among patients attending Medicine out-patient department of a tertiary care hospital in Chennai.

As the use of such scoring system could prove to be a cost-effective method for diabetes research, IDRS is of great importance. IDRS has the best sensitivity (62.2%) and specificity (73.7%) for the community’s identification of undiagnosed diabetes. In the present study, IDRS has been very useful to identify the high-risk individuals among the study population.

Majority of our participants had moderate risk of developing diabetes. 35.2% (112), 55.03% (175) and 9.7% (31) of the participants were found to be in high risk, moderate risk and low risk for developing diabetes respectively. Similar results were seen in the study carried out by Ashturkar MD et al., who found that 27.42%, 47.58% and 25% of the participants were in high, moderate and low risk respectively. Here, moderate risk individuals are higher than the high-risk individuals as in this present study. On the other hand, similar findings of high risk were also reported in a study done by Chowdhury et al., where 31.5% had high risk, and 22.5% had low risk but our study had lesser participants at low risk compared to both the studies followed by high risk. Female participants had higher risk of developing diabetes which is similar to a study done by Dugg P et al.

It was found that IDRS with high risk in urban area was 36.2% whereas in the previous study conducted in urban area, the high risk IDRS was found to be 42.9% and in another study, high risk IDRS in urban area was 32.33%. 32.6% of the participants
Table 1: Socio-demographic factor wise distribution of the study subjects (n=318)

| VARIABLES          | HIGH RISK (n=112, 35.2%) n (%) | MODERATE RISK (n=175, 55.03%) n (%) | LOW RISK (n=31, 9.7%) n (%) | TOTAL (n=318, 100%) n (%) |
|--------------------|---------------------------------|-------------------------------------|----------------------------|--------------------------|
| Gender: Male       | 23 (28.4)                       | 52 (64.2)                           | 6 (7.4)                    | 81 (100)                 |
|                    | Female                          | 89 (37.6)                           | 123 (51.9)                | 237 (100)                |
| Living Sector:     | Urban                           | 82 (36.3)                           | 125 (55.3)                | 19 (8.4)                 | 226 (100)                |
|                    | Rural                           | 30 (32.6)                           | 50 (54.4)                 | 12 (13.0)                | 92 (100)                 |
| Socio Economic Class | Upper Class         | 40 (38.8)                           | 55 (53.4)                | 8 (7.8)                  | 103 (100)                |
|                    | Upper Middle Class            | 35 (36.5)                           | 53 (55.2)                | 8 (8.3)                  | 96 (100)                 |
|                    | Middle Class                  | 28 (36.4)                           | 40 (51.9)                | 9 (11.7)                 | 77 (100)                 |
|                    | Lower Middle Class            | 8 (22.9)                            | 22 (62.9)                | 5 (14.2)                 | 35 (100)                 |
|                    | Lower Class                   | 1 (14.3)                            | 5 (71.4)                 | 1 (14.3)                 | 7 (100)                  |
| Religion: Hindu    | 90 (34.4)                      | 142 (54.2)                          | 30 (11.4)                 | 262 (100)                |
|                    | Christian                      | 17 (38.6)                           | 27 (61.4)                | -                       | 44 (100)                 |
|                    | Muslim                         | 5 (41.7)                            | 6 (50)                   | 1 (8.3)                  | 12 (100)                 |

Table 2: Association of characteristics among study subjects with IDRS (n=318)

| VARIABLES          | HIGH RISK (n=112, 35.2%) n (%) | MODERATE RISK (n=175, 55.03%) n (%) | LOW RISK (n=31, 9.7%) n (%) | TOTAL (n=318, 100%) n (%) | P  |
|--------------------|---------------------------------|-------------------------------------|----------------------------|--------------------------|----|
| Type of Work:      | Skilled                        | 40 (28.6)                           | 87 (62.1)                 | 13 (9.3)                 | 140 (100) | 0.045 |
|                    | Unskilled                      | 65 (42.5)                           | 75 (49.0)                 | 13 (8.5)                 | 153 (100) |
|                    | Semiskilled                    | 7 (26)                              | 13 (52)                   | 5 (20)                   | 25 (100)  |
| Education:         | Illiterate                     | 8 (53.3)                            | 4 (26.7)                  | 3 (20)                   | 15 (100)  | 0.031 |
|                    | Primary School                | 8 (38.1)                            | 11 (52.4)                 | 2 (9.5)                  | 21 (100)  |
|                    | Middle School                 | 49 (38.6)                           | 72 (56.7)                 | 6 (4.7)                  | 127 (100) |
|                    | High School                   | 10 (27.0)                           | 20 (54.1)                 | 7 (18.9)                 | 37 (100)  |
|                    | Diploma                        | 3 (20)                              | 10 (66.7)                 | 2 (13.3)                 | 15 (100)  |
|                    | Graduate                       | 15 (26.8)                           | 38 (67.9)                 | 3 (5.4)                  | 56 (100)  |
|                    | Professional Degree            | 19 (40.4)                           | 20 (42.6)                 | 8 (17.0)                 | 47 (100)  |
| Type of family:    | Nuclear family                 | 83 (39.3)                           | 108 (51.2)                | 20 (9.5)                 | 211 (100) | 0.093 |
|                    | Joint family                   | 29 (27.1)                           | 67 (62.6)                 | 11 (10.3)                | 107 (100) |

Chart 1: Chart representing the risk of developing diabetes
in rural areas had high risk in our study, while 29.7% of the participants in rural areas had high risk in another study carried by Raghuram et al.\[9\]

In the present study, 42.4% (135) of the total participants were <35 years of age and 57.5% (183) were aged between 35 and 49 years. While in the previous study, 111 (47.2%) were <35 years, 67 (28.5%) were 35–49 years and 57.5% (183) were aged between 35 and 49 years. While in the previous study, 111 (47.2%) were <35 years, 67 (28.5%) were 35–49 years and 57.5% (183) were aged between 35 and 49 years.

About 4% of the subjects in this study were illiterate, whereas it was 20% in the previous study.\[9\]

Most of the subjects (53.4%) had no family history of diabetes, while 37.7% of the subjects had family history of diabetes among either of their parents and 8.8% among both the parents. Out of this, 75% of the subjects with both parents’ diabetic were under high risk category. Similar observations were found in a study done by vidya et al., 4.7% of the respondents had a family history of diabetes with both parents and also in another study carried by Gupta et al., majority of the respondents (68.5%) had no family history of diabetes.\[11\]

### Conclusion

Overall, this study reflects the current situation of the prevalence of diabetes among the people of suburban area in Chennai. This study highlights the risk factors for diabetes corresponding to increasing population with high risk for diabetes in the last few years. The prevalence of high risk for diabetes is 35.2% in this study. IDRS is a cost-effective tool which includes both modifiable and non-modifiable risk factors so that in the high-risk group, certain lifestyle modifications and appropriate measures can be done. Thus, these can help us bring more awareness among people about their risk of developing diabetes.

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### Conflicts of interest

There are no conflicts of interest.

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