Detecting Undiagnosed Diabetes in Urban Asian Indians - Role of Opportunistic Screening

A Ramachandran, C Snehalatha, V Vijay, S Colagiuri*

Abstract
Background: The aim of the study was to determine the proportion of incidental to symptomatic diagnosis of diabetes and to compare the profile of symptomatic and incidentally diagnosed diabetic subjects.

Methods: One thousand newly diagnosed diabetic subjects (WHO criteria) were studied. Clinical, demographic, anthropometric details, blood pressure, glycaemic and lipid parameters were recorded. Reasons for medical check up were noted.

Results: Among the 1000 subjects, 29% were symptomatic for diabetes and 71% were incidentally diagnosed to have diabetes. Symptomatic subjects were younger, had higher glycaemia and prevalence of hypertension.

Conclusion: The results show that majority of type 2 diabetic subjects remain asymptomatic and opportunistic screening for diabetes would be required for the early diagnosis of the disorder.

INTRODUCTION
Diabetes is a major health care burden in India especially in the urban areas. Nearly 70% of urban diabetic cases are diagnosed, while in rural areas > 70% are undetected. A long asymptomatic stage of diabetes is known to exist causing cellular damage and complications prior to clinical diagnosis. Screening for diabetes is one strategy to prevent this.

The present study is an analysis of newly diagnosed people with type 2 diabetes referred to a diabetes specialty centre to find out the proportion diagnosed incidentally and also to compare the profile of subjects with symptomatic and incidentally diagnosed diabetes.

MATERIAL AND METHODS
One thousand consecutive newly diagnosed type 2 diabetic subjects were studied. Demographic, anthropometric parameters, resting blood pressure, fasting lipids, fasting and 2 hr post-glucose plasma glucose and HbA1c were measured using standard procedures. History of hypertension, family history of diabetes, reasons for the medical examination which resulted in the diabetes diagnosis and presence of typical diabetes symptoms were ascertained.

The 1000 study subjects (M:682, W :318) were diagnosed according to WHO criteria; all of them had undergone standard OGTT. Group comparisons of continuous variables were done using Students’ ‘t’ test and categorical variables were compared by X² test.

RESULTS
In the study group 290 were symptomatic (Group 1) and 710 were incidentally diagnosed (Group 2). None were taking treatment for diabetes at the time of assessment. In 60% of Group 2 (42.5% of the total), diabetes was detected during a pre-surgical check-up of during investigations for nonspecific complaints such as aches and pains or respiratory infections and 40% were detected on routine medical check-up.

The characteristics of the two groups are shown in Table 1. Symptomatic subjects were significantly younger, and had higher HbA1c and fasting and postprandial plasma glucose (p < 0.01 for all). The prevalence of hypertension was higher (p < 0.02) in the incidentally diagnosed group while first-degree family history and lipid parameters were similar in both groups. The symptomatic group 2.3 kg less but this difference was not significant.

DISCUSSION
Many people with previously undiagnosed diabetes have significant hyperglycaemia at presentation. The findings of this study are similar to a previous report that symptomatic
people with newly diagnosed diabetes had a mean fasting plasma glucose of the order of 220 mg/dl while asymptomatic people had values of approximately 180 mg/dl. The proportion of people with symptoms in this survey was similar to that reported by Graber et al who found that in 71% of hospitalized diabetic subjects the diagnosis of diabetes was incidental. In the UKPDS cohort, the proportion of symptomatic and asymptomatic diabetic subjects was similar among the Caucasians while among the Asian Indians, fewer had symptoms (9 Vs 11%). In our study, hypertension was more common in the incidentally diagnosed group as had been observed in an outpatient clinic in USA possibly because this was a recognized risk factor for undiagnosed diabetes and prompted screening.

Screening for undiagnosed diabetes is commonly recommended in India as a means of improving outcomes through minimizing the impact of diabetes complications. The large population and urban-rural differences of diagnosed to undiagnosed diabetes make population screening impractical in India. Since this study shows that the majority of people presenting with newly diagnosed diabetes are asymptomatic, opportunistic screening of asymptomatic individuals would be required to detect the majority of people with currently undiagnosed diabetes and should be considered as part of a medical checkup for unrelated conditions.

Acknowledgements
We thank Ms. G Usha for doing the data collection and Ms. Bindhu for the secretarial assistance.

REFERENCES

Table 1: Comparative profiles of the study groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1 Symptomatic n=290</th>
<th>Group 2 Incidental n=710</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>44.6 ± 10.7</td>
<td>46.7 ± 10.6</td>
<td>0.009</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>162 ± 9</td>
<td>161 ± 10</td>
<td>0.14</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>67.9 ± 12.3</td>
<td>70.2 ± 22.4</td>
<td>0.09</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>26.0 ± 4.3</td>
<td>27.0 ± 7.1</td>
<td>0.07</td>
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<tr>
<td>Hypertension*</td>
<td>13.4%</td>
<td>20.1%</td>
<td>&lt; 0.02</td>
</tr>
<tr>
<td>Fasting plasma glucose</td>
<td>213 ± 70</td>
<td>180 ± 60</td>
<td>0.001</td>
</tr>
<tr>
<td>(mg/dl)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Plasma glucose</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>120 min after OGTT</td>
<td>346 ± 100</td>
<td>298 ± 94</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>10.9 ± 2.7</td>
<td>9.3 ± 2.5</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>199 ± 132</td>
<td>195 ± 111</td>
<td>0.6</td>
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<tr>
<td>Cholesterol (mg/dl)</td>
<td>211 ± 49</td>
<td>214 ± 47</td>
<td>0.4</td>
</tr>
</tbody>
</table>

*X² test.*