Awareness about HbA1c test in type 2 diabetic patients during registration in a tertiary care centre in India

Srikant Medimpudi, Satyavani Kumpatla, Vijay Viswanathan

ABSTRACT

Background: Glycosylated haemoglobin (HbA1c) testing has become routine practice and maintenance of HbA1c within the normal range leads to improved metabolic control. AIM: To assess the awareness of HbA1c test among type 2 diabetic patients at the time of registration in a tertiary care centre in India.

Research Design And Methods: We conducted a cross-sectional survey of 240 (M: F 146:94) newly registered adults with type 2 diabetes in a tertiary care centre. Baseline demographic data of all patients was obtained. A researcher-administered survey was done to test patient’s knowledge on HbA1c test, their goal and their last A1c result. Factors which could influence the patient’s knowledge of HbA1c were also recorded.

Results: Only 11% of total patients knew about HbA1c test. About 69% of those who know about HbA1c test knew their target goal also. Overall only 6.7% patients knew about HbA1c test, their goal and last A1c result. Eighty nine percent didn’t know about HbA1c test. Low income groups are more ignorant compared to high income group. Patients who had not visited the hospital regularly had poor awareness than who had more (> 4) visits per year (71.5% vs. 28.5%). Awareness levels were poor among patients attending a general physician than patients attending a diabetes care specialist (57.9% vs. 37.9%).

Conclusion: HbA1c awareness among Indian patients with diabetes during registration in tertiary care centre is very poor. Patients with less number of consultations per year, lower educational levels, low income and urban hailing had poor knowledge about the HbA1c test.

INTRODUCTION

Diabetes is a common chronic condition that can lead to significant morbidity and mortality [1,2]. Evidences show that achieving good glycemic control can delay or prevent complications of both type 1 and type 2 diabetes [3-5]. The primary goal in the treatment is to reduce and maintain blood glucose levels in the near normal range and it provides an opportunity for patients to live without complications [6]. Glycosylated hemoglobin (A1c) test which provides an index of a patient’s average blood glucose level for the past 2-3 months [7], is the most widely accepted and reliable measure of long-term glycemic control.

Many factors like age, adherence to prescribed hypoglycemic medications [8], diet and life style modification play a significant role in attaining good control, but awareness about HbA1c test itself [9] with goal oriented approach in attaining target A1c is also crucial. Patients were more likely to follow life style changes when the importance of maintaining goal A1c for good glycemic control was stressed. Follow-up visits with health care providers [10] and self monitoring of blood glucose also play an important role in the maintenance of glycaemic control. Patients’ understanding of HbA1c, its goal and implications of uncontrolled A1c on long-term health risk is essential.

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Patients’ knowledge about diabetes and HbA1c comes mainly from health care providers. Clinicians have the opportunity to use this test to improve diabetes management and they should discuss about the results with the patients [11]. The use and interpretation of HbA1c results among physicians [12] have been studied, but there is paucity in studies of patients’ knowledge, and understanding of HbA1c testing. The aim of this study was to assess the awareness about HbA1c test in type 2 diabetic patients during registration in a tertiary care centre and to identify the factors influencing the patient’s knowledge of HbA1c.

RESEARCH DESIGN AND METHODS

The study subjects were selected from a tertiary care centre for diabetes in India during the period of August to October 2007. We studied 240 (M: F 146:94) randomly selected type 2 diabetic patients newly registered in the out patient department. Patients of all socio-economic strata attend the centre for routine management of diabetes. The study patients were treated elsewhere for diabetes and for the first time they had registered in our centre. All the participants gave informed consent.

Each patient’s baseline demographic data on age, sex, location (urban / rural), annual household income (≤ Rs. 100000 or > Rs. 100000), education (illiterate, School/high school, college) and duration of diabetes were recorded. Patients were asked to fill up a short questionnaire designed to obtain information about anti diabetic medications they were currently taking (diet, oral medication only, insulin only, Insulin + OHA), average number of visits per year that patients had to their health care provider (including visits to emergency rooms or hospital admission), whether treated by a physician / diabetes care specialist / self treated and asked whether they perform self monitoring of blood glucose at home or not. The questionnaire was evaluated in 10 patients in a pilot study prior to administering it to the study patients and minimal changes were made prior to standardization.

A researcher-administered survey was then employed to assess patients’ awareness about HbA1c test, their target goal and last A1c value. Each study patients responded to three open ended questions including “What does HbA1c test mean?” (Respondents were classified as having accurate awareness about the test if they answered it as overall glycemic control test or 2-3 months blood sugar average test. Respondents were coded as unaware of the test if they answered wrongly or if responded, “I don’t know.”).

Respondents who were aware of the test were then asked, “What is your HbA1c goal?” (We classified respondents as ‘Aware and goal known’ if they mentioned their target goal as less than 7%. Respondents were coded as not knowing goal if they answered wrongly or if responded, “I don’t know.”). Respondents who were aware of their goal were then asked, “What is your last HbA1c result?” (We classified respondents as knowing their HbA1c value if their actual test result was within 0.5 percentage points of the lower or upper boundary of the mentioned value). For example, if respondents reported that their HbA1c was 7, they were grouped as knowing their HbA1c if their recorded HbA1c was within 6.5-7.5. Respondents were coded as not knowing their value if their estimate differed by > 0.5% or if responded, “I don’t know”). Patients who are unaware of the HbA1c test were educated regarding the test and their target goal.

Patient’s medical records were reviewed to confirm the above information as well as to document respondents’ most recent HbA1c results taken before the survey. If respondents had no documented HbA1c results, we recorded this value as ‘no result’. Mean, standard deviation and proportions are reported as relevant. SPSS version 10 © was used for statistical analysis.
RESULTS

A total of 240 (M: F 146:94) subjects with type 2 diabetes were enrolled and none of them refused to participate in the study. The mean age was 50.2 ± 11.3 years and most patients were diagnosed with diabetes 5.41 ± 5.2 years prior to the study. Table 1 shows the demographic and clinical characteristics of the study subjects. The majority of patients were hailing from urban areas (86.3%). Regarding the education levels, 56.3% had a high school education or less, 35.8% are graduates and 8% are illiterates. About 96.7% had an annual household income of Rs.100,000 or less. At the time of survey, 85% were using oral hypoglycemic agents alone, 14.6% were using insulin in combination with or without oral agents and 0.4% of patients were being managed exclusively with diet.

Table 1: Demographic and clinical characteristics of the study subjects

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>N, M:F</td>
<td>240 (146:94)</td>
</tr>
<tr>
<td>Age (years) (Mean, SD)</td>
<td>50.2 ± 11.3</td>
</tr>
<tr>
<td>Duration of diabetes (years)</td>
<td>5.4 ± 5.2</td>
</tr>
<tr>
<td>Location</td>
<td>n (%)</td>
</tr>
<tr>
<td>Rural (n = 33)</td>
<td>33 (13.8)</td>
</tr>
<tr>
<td>Urban (n = 207)</td>
<td>207 (86.3)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>19 (7.9)</td>
</tr>
<tr>
<td>School / High school</td>
<td>135 (56.3)</td>
</tr>
<tr>
<td>College</td>
<td>86 (35.8)</td>
</tr>
<tr>
<td>Annual income (INR)</td>
<td></td>
</tr>
<tr>
<td>≤ 100,000</td>
<td>232 (96.7)</td>
</tr>
<tr>
<td>&gt; 100,000</td>
<td>8 (3.3)</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
</tr>
<tr>
<td>OHA</td>
<td>204 (85)</td>
</tr>
<tr>
<td>Insulin OHA</td>
<td>35 (14.6)</td>
</tr>
<tr>
<td>Diet</td>
<td>1 (0.4)</td>
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Figure 1: Details of awareness about HbA1c test among the study subjects

Figure 1 shows the details of awareness about HbA1c test among the study subjects. 89% (214/240) of the subjects does not know about HbA1c test, while 11% (26/240) knew about HbA1c test. 69% (18/26) of those who know about HbA1c knew their HbA1c goal also and 89% (16/18) of them remember their last A1c result. Overall, only 7.5% (18/240) of total patients knew about HbA1c test and their target goal and 6.7% (16/240) knew about HbA1c test, their goal and last A1c result.

Table 2 shows the description of subjects who are unaware of HbA1c test. A larger percentage of subjects are hailing from urban areas (85%) Male preponderance was seen in unawareness about the HbA1c test. Majority of the subjects had lower levels of education in this group of subjects (67.3% vs. 32.7%).

Table 2: Description of subjects who are unaware of HbA1c test

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>131 (61.2)</td>
</tr>
<tr>
<td>Women</td>
<td>83 (38.8)</td>
</tr>
<tr>
<td>Duration of diabetes (years)</td>
<td></td>
</tr>
<tr>
<td>&lt; 10</td>
<td>164 (76.6)</td>
</tr>
<tr>
<td>≤ 10</td>
<td>50 (23.4)</td>
</tr>
<tr>
<td>Location</td>
<td></td>
</tr>
</tbody>
</table>
Rural | 32 (14.9)  
Urban | 182 (85.5)  

**Education**
Illiterate | 19 (8.9)  
School / High school | 125 (58.4)  
Collage | 70 (32.7)  

**Annual income (INR)**
≥ 100,000 | 207 (96.7)  
> 100,000 | 7 (3.3)  

**Frequency of hospital visits per year**
< 4 | 153 (71.5)  
≥ 4 | 61 (28.5)  

**SMBG**
Subjects who perform SMBG | 40 (18.7)  
Subjects who do not perform SMBG | 174 (81.3)  

**Treatment**
Self | 9 (4.2)  
Physician | 124 (57.9)  
Diabetologist | 81 (37.9)  

Low income group of subjects are more ignorant about the test compared to high income group (96.7% vs. 3.3%). Patients who had not visited hospital regularly ( < 4 hospital visits per year) had poor awareness than who had more (≥4) hospital visits per year (71.5% vs. 28.5%). Awareness levels are less among patients attending a general physician than patients attending a diabetes care specialist (57.9% vs. 37.9%). Higher percentages are unaware about the test in the group of subjects who do not perform self monitoring of blood glucose (81.3% vs. 18.7%).

**DISCUSSION:**
The present study was done with a questionnaire and assessed patients knowledge about HbA1c test during registration in a tertiary care centre for diabetes in India. Nearly 89% of the patients do not have knowledge about HbA1c test. Only 6.7% of the patients knew about HbA1c test, their goal and last A1c result. In India, numerous national and international organizations are working for the past decade in raising public awareness of the role of HbA1c in the development of diabetes-related complications. Individual medical health facilities dedicated to diabetes care also educate their patients about HbA1c, and motivate their patients in a goal oriented fashion, but the HbA1c awareness among Indian patients with diabetes during registration in a tertiary diabetes care centre is still very poor as per our study finding. Very few respondents in our study knew their target HbA1c goal.

A cross sectional study in US population examined the relationship between patient’s knowledge of recent HbA1c value and self management of diabetes. A minority of diabetic patients knew their most recent HbA1c value and those who knew their HbA1c values reported significantly better understanding about diabetes care [13]. Many of the earlier studies reported similar findings [14’15]. Contrary to the above findings, another study conducted in Norway by Skie et al [16] reported that majority of the studied type-1 diabetic patients were aware of their last A1c result and most patients knew their target HbA1c.

In our study majority of subjects who are unaware about the test are hailing from urban areas. They had lower levels of education and most of them belong to low income group. Patients who have not visited hospital regularly and patients attending a general physician had poor awareness about the HbA1c test. A high percentage of subjects are unaware in the group of subjects who do not perform self monitoring of blood glucose.

A study in the United States showed that 66% of patients did not know their last A1c result and only 25% accurately reported the value. Knowledge of A1c result was associated with higher educational levels [1]. Low levels of education were one of the reasons for unawareness about the test in our study. Knowledge about the test was poor despite majority of subjects are from urban areas.

In an earlier study we found that majority of patients who attend a tertiary care centre for
diabetes care knew about HbA1c test and half of them were aware about their target goal. Awareness about the test had a positive impact on maintenance of better glycaemic control (unpublished). Knowing about A1c test, particularly target goal motivates patients to effectively manage their diabetes, as well as positively reinforces those patients who are already effectively managing their diabetes. Scientific advances and advantages must be translated into practical steps, so that patients can use them to improve their health. There should be an increased focus on encouraging patients to be aware of and discuss specific information pertaining to their disease status and markers, such as HbA1c, blood pressure, and lipid values with their clinicians.

CONCLUSION:

In conclusion, our study showed that type 2 diabetic patient’s knowledge about HbA1c test was very poor during registration in a tertiary care centre for diabetes. Low levels of education, less number of hospital visits, non performance of self monitoring of blood glucose were associated with unawareness about the HbA1c test. Clinicians should provide information about this test and discuss their glycaemic goals to improve diabetes management.

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REFERENCES:


