Glycemic control among diabetic patients

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ABSTRACT

Objective: This study was carried out to assess control of blood glucose among diabetic patients attending Primary Health Care Centers in Riyadh.

Methods: It is a retrospective study where fasting blood glucose reading for all diabetic patients attending 3 randomly selected Primary Health Care Centers in Riyadh was taken during the months of March and April 2000. The patients were divided into 3 categories: those with excellent, those with acceptable and those with poor glycemic control (Fasting blood sugar 4-7, 7-10 and more than 10 mmol/litres).

Results: A total of 991 diabetic patients were involved in the study (83% men and 62% women). Those with excellent glycemic control represent 21% of patients in the first reading and 25% of the patients in the second readings, while those with poor control represent 49% and 44% of the patients in the two readings. The remaining are in the acceptable category.

Conclusion: Diabetes mellitus is poorly controlled in a large proportion of diabetic patients attending Primary Health Care Centers in Riyadh. Public education and awareness programs should be encouraged. Such programs must include the importance of appropriate lifestyle changes and of self monitoring of blood glucose at home.

Keywords: Diabetes mellitus, glycemic control, primary health care.

The present study was planned to assess blood glucose control of diabetic patients attending Primary Health Care Centers (PHCC) in Riyadh, the Capital of the Kingdom of Saudi Arabia.

**Methods.** This is a retrospective study, conducted on May 2000. Three Primary Health Care Centers (PHCC) were selected using the simple random sampling technique. The medical records for all diabetic patients registered in these PHCC were reviewed. Diabetic patients visit the PHCC on a monthly regular follow up visit according to an appointment system where the level of their fasting blood sugar (FBS) is read. Fasting blood sugar readings during the months of March and April 2000 were recorded in this study to assess the level of glycemic control of the patients. In patients who missed visiting the center in one of these two months, FBS reading in their previous visit to the center was taken. Level of glycemic control was calculated using the criteria of The Scientific Committee of Quality Assurance in Primary Health Care. Patients were divided into three groups. Those with excellent (FBS 4-7), those with acceptable (FBS 7-10) and those with poor glycemic control more than 10 mmol/L.

**Results.** The total number of diabetic patients in this study is 991 (379 males and 612 females). Only 21% of the patients in the first reading and 25% of the patients in the second reading show an excellent control of their blood glucose level, while 49% of patients for the first reading and 44% of the patients fall in the poor glycemic control category. Glycemic level for the remaining patients (30% in the first reading and 31% in the second reading) is in the acceptable range. No significant difference between male and female patients was found in their glycemic control. Table 1 shows the level of glycemic control among diabetic patients during the months of March and April for the year 2000.

<table>
<thead>
<tr>
<th>Month</th>
<th>Sex</th>
<th>Excellent No. of patients (%)</th>
<th>Acceptable No. of patients (%)</th>
<th>Poor No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>76 (20)</td>
<td>111 (29)</td>
<td>192 (51)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>129 (21)</td>
<td>190 (31)</td>
<td>293 (48)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>205 (21)</td>
<td>301 (30)</td>
<td>485 (49)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>96 (25)</td>
<td>118 (31)</td>
<td>165 (44)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>152 (25)</td>
<td>191 (31)</td>
<td>269 (44)</td>
</tr>
<tr>
<td>June</td>
<td>Total</td>
<td>248 (25)</td>
<td>309 (31)</td>
<td>434 (44)</td>
</tr>
</tbody>
</table>

| Total | 379    | 612  | 991  |

| Total | 612    | 991  |

Table 1 - Level of glycemic control among diabetic patients during the months of March and April 2000.

**Discussion.** Although diabetes mellitus is associated with a high incidence of complications, its control results in reduction of not only morbidity and mortality, but also economic burden of the disease. This control is considered as one of the standards of the outcome of diabetes mini clinics in PHCC. HbA1c, fasting and post prandial blood glucose levels are used to assess the level of glycemic control. Since HbA1c is not available in PHCC, FBS is used to assess level of glycemic control in this study. The study shows that the percentage of excellent glycemic control among diabetic patients under the study in the first reading is 21 and under the second reading is 25. It is much less than the national goals of diabetic control which consider more than 40% of diabetic patients to be in the excellent category. In this study we can also observe the high percentage of diabetic patients with poor glycemic control in both readings (49 in the first and 44 in the second). These figures should be less than 10% in the national goals of diabetic control. The poor glycemic control achieved in this study was also found in other local and international studies, e.g. a local study was conducted on diabetic patients at King Khalid University Hospital, Riyadh. It found that 77% of the patients had HbA1 values above normal range, and 16.5% had severe hyperglycemia (Blood sugar > 27.7 mmol/L). Glycemic control was also found to be generally poor in diabetic patients in a typical English community. For these and other reasons some authors believe that practical measures of achieving glycemic targets in diabetic patients is quite difficult. Normalization of glucose values were not achieved as a group in the intensively treated patients involved in the Diabetes Control and Complication Trial (DCCT) due to mean glucose values being 40% above normal limits. More local studies are needed to assess glycemic control among diabetic patients in the Kingdom. The relatively high prevalence of poor glycemic control achieved in this study, reflects the greater needs for more efforts to improve it. There is a pressing need for public education programs and...
for promoting public awareness. The Kingdom of Saudi Arabia has faced a rapid development program and socioeconomic transformation over the past few decades that resulted in changes in dietary habits and increased prevalence of obesity, associated with less physical activity. Awareness programs about the importance of appropriate life style changes (e.g. diet and exercise) are of paramount in controlling the disease. Patient and family education for self management should be encouraged. The self-monitoring of blood glucose (SMBG) by patients has been designed to improve glycemic control.21

References