Variations in care of diabetes in primary care centres in Tunis

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SUMMARY
The aim of this study was to investigate the care of diabetes in primary care in the public sector in Greater Tunis and in particular, to assess variations in care across centres with the intention of seeking explanations for any differences identified. We undertook a retrospective medical review of patients with diabetes from four primary care health centres. Data were collected concerning patient characteristics, process of care criteria, outcome of care criteria, attendance rates, treatment and health centre characteristics.

The total sample size was 235 patients. Outcome of care criteria were found to be similar across each of the centres. Process of care criteria were found to be significantly varied between the centres for all measurements used. Variations were also found in treatment and attendance rates across the health centres. In conclusion, there is a significant variation in the management of diabetes in primary care across centres within Greater Tunis, despite the use of standardised, national guidelines. A number of factors related to the centres may have given rise to these variations.

Key-words: Diabetes · Quality of care · Management.

REVUE DE LA QUALITÉ DE LA PRISE EN CHARGE DES DIABÉTIQUES DANS LES CENTRES DE SANTÉ DE BASE

L’objectif de notre travail consiste à évaluer la prise en charge des diabétiques dans les centres de soins de santé de base dans le grand Tunis. Nous essayerons à travers cette étude rétrospective de ressortir les éventuelles causes de variations dans la qualité de suivi des patients diabétiques d’un centre à l’autre parmi les centres pré-cités. Nous avons relevé du dossier médical des chroniques les données portant sur l’identité des patients, la qualité de leur prise en charge sur le plan clinique, biologique et thérapeutique ainsi que l’existence d’éventuels défaillants.

Dans notre échantillon, composé de 235 patients, nous avons relevé une différence significative dans les différents paramètres de suivi des diabétiques, dans le nombre de défaillants et dans la prescription thérapeutique d’un centre de soins à l’autre. En conclusion, il est intéressant de noter que malgré l’existence d’un programme national de prise en charge des diabétiques et des hypertendus dans les structures de première ligne, il existe différents facteurs de variations de la qualité de la prise en charge qui dépendent du personnel soignant, du patient et de l’emplacement du centre de soins.

Mots-clés : Diabète · Qualité de soin · Prise en Charge.
Tunisia, like most countries around the world, is experiencing a major increase in non-communicable diseases such as diabetes. A doubling of the number of people with diabetes has been reported since the 1980s [1] and a recent survey in the country suggested that in the capital, Tunis, 10% of adults now have diabetes mellitus [2]. A large proportion of patients with diabetes in Tunisia are managed in primary care centres within the public sector. In the 1990s the Tunisian Ministry of Health instituted a national programme of hypertension and diabetes management within primary care. The programme incorporates teaching of primary health care doctors and the use of national, standardised protocols, medical dossiers and registers. However, the process of care of patients with diabetes is complex. To improve quality of care, information is needed about the variables that influence care and the obstacles faced in improving care.

A study was therefore conducted to investigate the care of diabetes in primary care in the public sector in Tunis. In particular, variations in care across centres were to be assessed with the intention of seeking explanations for any differences identified.

**Patients and methods**

Approval for the study was granted by the Tunisian Ministry of Public Health. One health centre from each of the four regions of Greater Tunis was selected and visited on a number of occasions. The selection was made by each regional co-ordinator of the national program and in three of the four cases, the centre in which the co-ordinator worked was selected. A random sample comprising at least 25% of the patients with diabetes managed at each centre was collected and the medical dossiers studied. Data were collected from the subjects clinical records concerning the patient (age, gender, socio-economic status); process of care criteria (records of weight, blood pressure, fasting glucose, cholesterol, creatinine, glycosylated haemoglobin (HbA1c), fundoscopy, ECG, foot examination and cardiovascular examination); outcome of care criteria (results of BMI, blood pressure, fasting glucose, cholesterol and creatinine); attendance rates; treatment; and health centre characteristics. Criteria for process of care measurements were based on the guidelines within the national program.

Descriptive analysis was performed using 2 by 2 tables for comparison of proportions and analysis of variance (or Kruskal-Wallis if data was not normally distributed) for comparison of means.

**Results**

A sample of between 25% and 50% of diabetic medical dossiers was taken from each centre comprising a total of 235 patients. The mean age of patients was 60.2 years (range 25-93), the majority were female (71.5%) and almost all had type 2 diabetes (96.2%).

Two health centres had significantly younger patients than the other two (p < 0.01), but there was no significant variation in the proportion of women across the centres. Socio-economic status was assessed using occupation, patient’s level of schooling and health insurance coverage at each centre. All three measurements were significantly varied across the centres.

Process of care criteria were based on the proportion of patients who had each measurement documented in the 12 months preceding the study visit. Figure 1 demonstrates that all process of care measurements varied widely (p < 0.05 for all measurements) between the centres.

Centre 4 has strikingly lower rates of processes of care, although there remains a significant variation across the other three centres. In contrast, there was no significant difference in process of care criteria between men and women.

Outcome of care criteria were based on the last measurement recorded in the medical notes. The mean blood pressure was 139/83 mmHg (with a range of mean blood pressure results across the centres of 132-149/80-86); BMI 28.7 (range 27.3-29.5); cholesterol 5.2 mmol/l (range 4.8-5.4); creatinine 79.3 µmol/l (range 76.8-84.2); fasting glucose 10.6 mmol/l (range 9.4-10.9). HbA1c results were excluded because of the low number recorded. The only significant variation found was systolic blood pressure; BMI, cholesterol, creatinine, fasting glucose and diastolic blood pressure were all found to be similar across the centres. When men and women were compared, women were found to have a significantly higher BMI and lower creatinine; the other measurements were found to be similar.

The attendance rates and treatment used at each centre are listed in Table I. The only oral medications used at the centres were glibenclamide and metformin, as mono or dual therapy. Significant variations were found in the proportion of patients on diet only and those on dual therapy. Characteristics of the health centres are listed in Table II. The rural centre (centre 2) was found to have a much higher number of consultations per doctor, and the patients had to travel a greater difference to the nearest hospital (for fundoscopy and ECG measurements) and laboratory (for blood tests). Within the national program doctors are offered extra training in diabetes and hypertension management and the number of those who had attended this training is noted in Table II. Significantly, centre 4 was the only centre in which the corresponding regional co-ordinator of the national program did not work.

**Conclusions**

In this study we found a significant variation in the management of diabetes in primary care in Greater Tunis, despite the introduction of standardised, national management guidelines and medical dossiers. All process of care measure-
ments were found to be significantly varied. This variation in care does not appear to have significantly affected the outcome of care measured in the short-term although it is difficult to link measures of process of care and measures of outcome in transversal studies such as this. Studies elsewhere have similarly shown variations in processes but not outcomes [3, 4] and it has been suggested that measuring well supported processes may be more enlightening than monitoring outcomes [5].

It is acknowledged that this study relies on the recording of care and not necessarily the care that was delivered, and that it is not a random sample of centres and thus may not be fully representative of primary care in Greater Tunis. However, it is encouraging to note that the process and outcome of care results compare favourably with published studies.

Table I
Attendance rates and treatment at the four health centres.

<table>
<thead>
<tr>
<th>Centre</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of visits *</td>
<td>3.9</td>
<td>3.6</td>
<td>2.9</td>
<td>3.1</td>
</tr>
<tr>
<td>Percentage of defaulters **</td>
<td>13.4</td>
<td>11.4</td>
<td>8.2</td>
<td>15.5</td>
</tr>
<tr>
<td>Type of Treatment (percentages)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diet alone</td>
<td>15</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Oral monotherapy</td>
<td>33</td>
<td>55</td>
<td>53</td>
<td>21</td>
</tr>
<tr>
<td>Oral dual therapy</td>
<td>36</td>
<td>36</td>
<td>30</td>
<td>65</td>
</tr>
<tr>
<td>Insulin</td>
<td>16</td>
<td>9</td>
<td>14</td>
<td>12</td>
</tr>
</tbody>
</table>

* In the preceding full calendar year.

** A defaulter was a patient who had previously consulted the health centre but had not attended in the preceding 12 months.

Table II
Characteristics of the four health centres.

<table>
<thead>
<tr>
<th>Centre</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of diabetics</td>
<td>264</td>
<td>87</td>
<td>281</td>
<td>130</td>
</tr>
<tr>
<td>Number included in the study</td>
<td>67</td>
<td>44</td>
<td>73</td>
<td>51</td>
</tr>
<tr>
<td>Location</td>
<td>Urban</td>
<td>Rural</td>
<td>Semi-Urban</td>
<td>Semi-Urban</td>
</tr>
<tr>
<td>Consultations per year</td>
<td>12,689</td>
<td>14,081</td>
<td>21,140</td>
<td>13,140</td>
</tr>
<tr>
<td>Number of doctors</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Number of doctors undertaken extra training in diabetes</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Presence of the regional co-ordinator</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Functioning Glucometer</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure 1
Percentage of patients for whom care was documented in the preceding year.
from primary care elsewhere [3, 6]. Although this sample may have a bias towards superior health centres, the results demonstrate that good standards of care can potentially be performed within primary care in this country. The main shortcoming of the process of care measures relative to the national guidelines is the very small number of HbA1c measurements performed. However, it has been suggested that where resources are short, glucose testing is a reliable indicator of poor control that can be used to modify treatment safely [7].

The predominance of women in our sample is striking. Discussions with professionals in this country confirm that women do visits the public sector primary care centres more than men, despite the similar prevalence rates. This may be due to men having difficulty taking time off work, health centres being open in the mornings only, or men taking their illness less seriously: this is an important area that warrants further study.

Not surprisingly, very few patients in our study had type 1 diabetes. The national program is predominantly intended to care for patients with type 2 diabetes but patients can choose to attend the centres rather than the local hospital if they wish and if the primary care physician is in agreement. Repeating the analysis without the patients with type 1 diabetes did not alter the significant variations found.

The imperative task is to seek to explain these variations of care between four health centres, all within the same city, and all using standard medical dossiers and guidelines. Previous studies in other geographical locations have suggested a wide range of factors relating to the patient, the health professional and the organisation of care, that may affect the quality of care of patients with diabetes [8, 9]. Our study seems to suggest that the influence of the health centre is a strong determinant of the care received by patients with diabetes in this country. Although the study is too small to calculate statistical correlations, a number of characteristics of the health centres can be suggested as being related to the variations in care observed. It is striking to note that the centre with the poorest levels of recording of care (centre 4) is the centre without a regional co-ordinator and with the lowest number of doctors who had attended training in diabetes. This supports the assumption that training physicians in diabetes improves the process of care of patients with diabetes and has been reported in some [9], but not all studies [3]. There does not appear to be any correlation between location of the centre, the presence of a functioning glucometer or the percentage of patients seen at the health centres and the process of care. The range of treatment was very similar in all the centres with only two medications and four forms of insulin being used. However, the significant differences in the proportion of patients on diet only and dual therapy suggest that other factors, in addition to the national program guidelines, play a role in determining the patient’s treatment. This variation in treatment confirms previous findings that even with appropriate knowledge, clinicians do not always follow guidelines [10]. Centre 4 again shows some differences to the other centres and this may be due to the lack of extra training of the doctors at this centre.

The average number of consultations in the preceding year is high considering the number of defaulters. The national program suggests 3 monthly visits and it seems that most attendees are being seen regularly. The number of defaulters is difficult to interpret as it includes patients who may have decided to attend a private clinic or secondary care for their management, as well as patients who have died or moved area. However, centre 4 has the highest proportion of apparent defaulters and this along with the poorer recording of care may support the hypothesis that this centre is offering poorer quality of care compared to the other three centres.

This study is too small to make definite conclusions but a number of hypotheses have been generated that warrant further study. A fuller understanding of variability of care within the context of the patients cultural environment will be important to improve quality of care of patients with diabetes around the world.

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References