Quality of care of patients with type 2 diabetes in a Tunisian university hospital

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SUMMARY
Objectives: The aim of this retrospective study was to explore the quality of ambulatory management provided to patients with type 2 diabetes.

Methods: Five hundred ninety-three patients with type 2 diabetes attended our outpatient department in 2002. Clinical and biological data were collected from the medical records of these patients.

Results: The mean age was 61.7 ± 10.5 years; 60.5% were women and known duration of diabetes was 11.8 ± 7.5 years. Eighty-five percent of patients had 2 or more visits and 58% were on insulin. Glycaemic control was assessed using fasting blood glucose in 97.3%, post-prandial blood glucose in 28.3% and glycated haemoglobin in 50.6% of cases. HbA1c was over 8% in 60.7% of patients. Weight was measured at least once in 86.5% of cases, blood pressure in 91.2% and lipids levels estimated in 58%. BMI was less than 25 kg/m² in 16.2% of patients and blood pressure less than 140/90 mmHg in 40.1% of cases. Foot examination was recorded only in 5% of patients. ECG was performed in 23.8% of cases and fundoscopy in 19.2% of patients. Proteinuria was documented in 19.1% of cases and renal function assessed in 54.4% of patients.

Conclusions: These findings suggest that the management of type 2 diabetes is still inadequately performed in our centre and more progress is needed to prevent micro and macrovascular complications.

Key-words: Type 2 diabetes · Quality of care · Cardiovascular risk factors · Complications.

Harzallah F, Alberti H, Kanoun F, Elhouch F, Slimane H. Quality of care of patients with type 2 diabetes in a Tunisian university hospital Diabetes Metab 2004,30,523-526

RéSUMÉ
Qualité de la prise en charge des diabétiques de type 2 dans un hôpital universitaire tunisien

Objectif : Le but de cette étude rétrospective était d’évaluer la qualité de la prise en charge ambulatoire des diabétiques de type 2.


Résultats : L’âge moyen était de 61,7 ± 10,5 ans, 60,5 % étaient des femmes et la durée connue de diabète était de 11,8 ± 7,5 ans. Quatre-vingt cinq pour cent des patients ont eu 2 consultations ou plus et 58 % étaient traités par l’insuline. Le contrôle glycémique a été évalué par la glycémie à jeun chez 97,3 % des patients, la glycémie post-prandiale chez 28,3 % et l’hémoglobine glyquée chez 50,6 % dont le taux était supérieur à 8 % chez 60,7 % parmi eux. Le poids a été mesuré, au moins une fois, chez 86,5 % des patients, la pression artérielle chez 91,2 % et le bilan lipidique pratiqué dans 58 % des cas. L’IMC était < 25 kg/m² chez 16,2 % des patients, la pression artérielle < 140/90 mmHg dans 40,1 % des cas. L’examen des pieds a été noté dans 5 % des dossiers, l’ECG a été pratiqué dans 23,8 % des cas et l’examen ophthalmologique chez 19,2 % des patients. La protéinurie a été recherchée dans 19,1 % des cas et la fonction rénale a été évaluée chez 54,4 % des patients.

Conclusions : Ces résultats confirment que la prise en charge des diabétiques de type 2 est loin d’être optimale et que des améliorations doivent être apportées afin de prévenir les complications micro et macrovasculaires.

Mots-clés : Diabète type 2 · Prise en charge · Facteurs de risque vasculaire · Complications.

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Received: June 18th, 2004; revised: August 30th, 2004

Type 2 diabetes mellitus is a large and growing health problem in Tunisia as in other developing countries [1]. The difficulty of managing this disease is linked to the number of factors which need monitoring including glycemic control, blood pressure control and screening for complications. There is now good evidence from the UKPDS and other studies that tight control of blood glucose and blood pressure reduces the risk of complications [2, 3].

In Tunisia there are three levels of medical care; primary, intermediate and tertiary, and there are both private and public health care systems. Within the public sector, the majority of patients are still required to pay a fee for their consultation, which also includes any medication prescribed, and laboratory tests. There is no reduction of the fee for patients with chronic disease such as diabetes.

The aim of this study was to explore the quality of medical management provided to patients with type 2 diabetes in a university teaching hospital, part of the tertiary care system in the capital city of Tunis.

Material and methods

This retrospective study was conducted among all type 2 diabetic patients who were hospitalized in our department before 2001 and still attending our outpatient department in 2002. Thus, all patients included in the study had been followed up within our outpatient department for a minimum of 12 months.

We excluded from the study patients with type 1 diabetes mellitus and those with gestational and secondary diabetes. The patients were classified as having type 2 diabetes according to their clinical features at diagnosis (family history of diabetes, age and BMI).

Clinical and biological data were collected from the medical records of patients regarding the patients’ date of birth, gender and date of diagnosis.

The data collected for each patient visit in the calendar year of 2002 were physical examination data (weight, blood pressure, foot examination), procedures recommended and their results (fasting blood glucose (FBG), post-prandial blood glucose (PPG), glycated haemoglobin (HbA1c), lipid profile, electrocardiogram (ECG), fundoscopy, proteinuria), prescribed medications and the visit date.

Data was analysed using the Epi-info 6 database program. Results are expressed as mean ± sd values and the Kruskall-Wallis test was used to compare means.

Results

700 type 2 diabetic patients attended our outpatient department in 2002: 107 were hospitalized in 2001 or 2002 and were thus excluded leaving 593 patients (359 women and 234 men) in the study. In 2002, our department consisted of 4 endocrinologists who saw all patients attending the department.

The mean age of our population was 61.7 ± 10.5 years (20-91 years).

Eighty-five percent of patients had 2 or more visits during the calendar year of 2002 and the mean number of visits was 2.59 ± 0.97.

Diabetes characteristics

Known duration of diabetes was 11.8 ± 7.5 years and 41% of patients were treated with oral anti-diabetic medication, 58% of patients were on insulin, and less than 1% were on diet alone.

Documentation of glycemic control (Table I)

Fasting blood glucose was less than 1.30 g/l in only 12.8% of cases, post-prandial glycaemia less than 1.80 g/l (4). Only 21.3% of patients had an HbA1c less than 7% and more than half were above 8% (Fig 1).

Documentation of cardio-vascular risk factors

Over a third of the patients (9.2% of women and 76.5% of men) were smokers. Weight was documented, at least once, in 2002 in 86.5%. The body mass index (BMI), available in 505 cases, was less than 22 kg/m² in 3% of patients,
Due to the short time reserved to see each patient with diabetes, the rate of recording of foot examination is low. This may be partly explained by non-compliance with care or a lack of facilities. Weight and blood pressure were commonly estimated in comparison with the very low frequency of actual care performed and may not give a completely accurate picture; for example, foot examination may be performed in more than 5% of cases but not always recorded. Some physical examinations and laboratory tests were performed less often. This may be due to problems of availability and of cost.

Our study is based on documentation of care and not on actual inspection of patients, which may not be representative of all hospital departments in our country. However, our results are similar to those published elsewhere in similar low-middle income countries [6-8].

Documentation of complications

Foot examination was recorded in only 5% of patients. Triglycerides level less than 1.50 g/l was noted in 55.6% of cases, HDL cholesterol level above 0.40 g/l in 60.6% and LDL cholesterol level less than 1.30 g/l in exactly one third of our study population.

Our study shows, as other studies, that the management of type 2 diabetes is still inadequately performed. Among them, only 20% had their blood pressure controlled to under 140/90 mmHg. One in four patients were on a lipid lowering drug, usually a fibrate. Lipids levels were estimated in 58% of patients at least once. Triglycerides level less than 1.50 g/l was noted in 55.6% of cases, HDL cholesterol level above 0.40 g/l in 60.6% and LDL cholesterol level less than 1.30 g/l in exactly one third of our study population.

Plasma urea and/or creatinine was documented in 54.4% of patients and renal failure [diagnosed as a glomerular filtration rate of less than 60 ml/min calculated using the Cockcroft and Gault formula [5]] was present in 36.9% of these patients. Patients with renal failure had higher blood pressure (146.4 ± 20.4 vs 141.1 ± 20.1 mmHg, p < 0.05, for systolic blood pressure and 82.7 ± 11.2 vs 80.8 ± 10.4, NS, for diastolic blood pressure) and the proportion of them who reached the treatment goal of 140/90 mmHg is the same as in the group of patients without renal failure (39.6% vs 42.0%).

More than the half of our patients had glycated haemoglobin above 8% and the proportion of patients having poor glycemic control seems higher than in other studies [10-12]. This may be partly explained by the non-compliance with diet as suggested by the high frequency of overweight and obesity in our patients. In addition, our health professionals may not be intensifying treatment appropriately.

Heart disease accounts for approximately 50% of all deaths among people with diabetes in developed countries [13]. The recognition and the management of risk factors such as hypertension, overweight and dyslipidemia is essential as it may delay or prevent heart disease in diabetic patients [2, 3]. Despite this evidence, these risk factors are not well controlled in our study population; only 20% of patients with diabetes and hypertension had a blood pressure of less than 140/90 mmHg, more than 40% of our patients are obese and more than a third do not reach lipid target values. The poor control of cardiovascular risk factors, shown in the majority of studies [12, 14, 15], may be partly due to non-compliance with the diet and drug regimens.

Likewise, diabetic retinopathy is a leading cause of blindness and visual disability and good control of glycaemia and blood pressure may postpone the onset and the progression of this retinopathy [3, 16]. Loss of vision can be prevented by early detection and treatment of retinopathy, including regular eye examination and timely intervention with laser treatment [17]. Thus, the low number of patients in our study who have a fundoscopy performed is a major concern. In Tunisia, patients are referred from our department to an ophthalmology department for their eye examination and this may explain the low number of fundoscopies performed in our study compared to other studies [7, 18].

Finally, diabetes is among the leading causes of kidney failure and several measures are available to slow the progression of renal damage [19]. They include control of hyperglycaemia, control of high blood pressure and intervention with medication in the early stage of diabetic nephropathy (renin-angiotensin system blockers...) [20, 21]. Therefore, screening and early detection of diabetic kidney disease are an important means of prevention. Only about 525 kg/m² in 13.2%, 25-30 kg/m² in 43.4% and 30 kg/m² or more in 40.4%.

Blood pressure was measured, at least once, in 91.2% of patients. Individual mean values of blood pressure were less than 140/90 mmHg in only 217 cases (40.1%). Just over 50% of patients were on one or more anti-hypertensive drug and among them, only 20% had their blood pressure controlled to under 140/90 mmHg.

One in four patients were on a lipid lowering drug, usually a fibrate. Lipids levels were estimated in 58% of patients at least once. Triglycerides level less than 1.50 g/l was noted in 55.6% of cases, HDL cholesterol level above 0.40 g/l in 60.6% and LDL cholesterol level less than 1.30 g/l in exactly one third of our study population.

Discussion

This study, carried out in an endocrinology department shows, as other studies, that the management of type 2 diabetes is still inadequately performed.

The short-comings of our study are that it is a small retrospective study performed in only one centre and thus may not be representative of all hospital departments in our country. However, our results are similar to those published elsewhere in similar low-middle income countries [6-8]. Our study is based on documentation of care and not on actual care performed and may not give a completely accurate picture; for example, foot examination may be performed in more than 5% of cases but not always recorded. However, it does appear that the physicians performed some physical examinations and laboratory tests more consistently than others. In fact, weight and blood pressure were commonly estimated in comparison with the very low rate of recording of foot examination. This may be partly due to the short time reserved to see each patient with diabetes in our department (5-6 minutes per visit). This fact could also influence the blood pressure values obtained in such conditions as it is impossible to offer each patient 5 minutes of rest within this timeframe.

Diabetes is the most common cause of non-traumatic amputation of the lower limb, which may be prevented by regular inspection and good care of the foot [9]. In other studies, foot examination was more frequently performed [6, 10].

Almost all of the patients had their plasma glucose measured at least once in 2002 but glycated haemoglobin, a more useful tool to assess chronic glycemic control, is performed less often. This may be due to problems of availability and of cost.

More than the half of our patients had glycated haemoglobin above 8% and the proportion of patients having poor glycemic control seems higher than in other studies [10-12]. This may be partly explained by the non-compliance with diet as suggested by the high frequency of overweight and obesity in our patients. In addition, our health professionals may not be intensifying treatment appropriately.

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Likewise, diabetic retinopathy is a leading cause of blindness and visual disability and good control of glycaemia and blood pressure may postpone the onset and the progression of this retinopathy [3, 16]. Loss of vision can be prevented by early detection and treatment of retinopathy, including regular eye examination and timely intervention with laser treatment [17]. Thus, the low number of patients in our study who have a fundoscopy performed is a major concern. In Tunisia, patients are referred from our department to an ophthalmology department for their eye examination and this may explain the low number of fundoscopies performed in our study compared to other studies [7, 18].

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20% of our patients were screened for proteinuria and about half had their renal function assessed. These results are disappointing but similar to other published studies [6, 7, 22].

Because the majority of patients with type 2 diabetes are cared for by general practitioners, only a few studies of quality of care have been carried out in a department such as ours. Our aim is that this be the initial step in developing a quality improvement program for diabetes care in our department and we plan to repeat our study in 2005. Improved organization and optimal collaboration between the three levels of the public care system may contribute to an improvement of care provided to patients with type 2 diabetes in our country.

References