The Overall Evolution of Lebanese Patients with Type 2 Diabetes Over 5 Years: A Comparison from the International Diabetes Management Practices Study Results

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Abstract

Type 2 Diabetes is a worldwide epidemic. Similar to other Western and Middle Eastern countries, many efforts are being made in Lebanon to study the characteristics of the population with type 2 Diabetes with the aim of optimizing treatment and preventing late complications. This study is a description of the evolution of the control of patients with type 2 Diabetes in Lebanon, over a 5 years period. 1285 and 1059 patients with type 2 Diabetes were recruited with a mean BMI in the overweight range. Their mean FBG decreased from 10.63 ± 4.06 mmol/L in 2006 to 8.54 ± 3.49 mmol/L in 2011. The mean duration of diabetes was 8.11 ± 7.23 years, comparable in 2006 and 2011. The mean HbA1c decreased from 8.1% (65 mmol/mol) to 7.8% (62 mmol/mol) in 2011, with 36.1% of patients reaching the target range <7% (53 mmol/mol) in 2011. Insulin-alone regimens were less common in 2011 and the use of combinations (Insulin + orals) increased from 15.2% to 19.6%. Screening rates for micro-vascular complications improved; in 2011, 68.5%, 86.7% and 63.6% for retinopathy, nephropathy and peripheral neuropathy versus 53.2%, 63.4% and 47.9% in 2006 respectively. When all Diabetes complications were combined, 43.7% of patients had at least one in 2011 and 56% in 2006. This study promises improvement in the care of patients with Diabetes in Lebanon, mostly in screening and complications prevention, however they remain poorly controlled with a high rate of obesity and a lack of lifestyle modifications.

Keywords: Type-2 diabetes; Epidemic; BMI; Insulin

Introduction

Diabetes Mellitus type 2 is a worldwide epidemic, its prevalence is rising progressively with estimates to reach 4.4% of the world population in 2030 [1]. Type 2 diabetes' rise parallels the upsurge of obesity and the aging population in Lebanon [2] among other middle-eastern countries; recent reports have shown a strong positive correlation between type 2 diabetes and increasing BMI and sedentary lifestyle in Lebanon [3]. Patients with Diabetes are at greatly increased cardiovascular risk and a comprehensive plan of care is necessary to overcome this threat. Many efforts are being gathered in Lebanon to study the characteristics of the patient's population with type 2 Diabetes in order to be able to raise more awareness, optimize treatment and prevent late complications. Taleb et al. [4] showed in their cross-sectional study a high prevalence of micro-vascular diabetic complications with at least one third of the patients having either nephropathy or retinopathy and up to 46% having albuminuria. As for the macro-vascular complications, around 20% have coronary artery disease (CAD) and Peripheral Vascular Disease (PVD) and 4.1% have a history of a Cerebrovascular Disease (CVD) [4]. This study describes and compares the characteristics of the Lebanese patients with type 2 Diabetes, between 2006 and 2011, and highlights the progression of their glycemic and metabolic control, the physicians' awareness regarding early screening for and the prevalence of diabetes complications, aiming to raise national awareness about this growing complex health condition.

Materials and Methods

The IDMPS is an international, multicenter, observational study of patients with Type 1 and Type 2 Diabetes. It randomly selected a pool of patients with Diabetes, representative of the general population in multiple selected countries in Asia, Eastern Europe, Latin America, Africa and the Middle East. A random sample of physicians from the participating countries recruited the first 10 patients older than 18 years of age presenting to their clinics with type 2 diabetes and the first 5 patients with Type 1 Diabetes during a 2-week time frame.

Informed consent was obtained from all participating patients. Ethics committee's approval was obtained from participating centers where such committees are in place.

The sample size was determined on a country basis, based on the primary objective, which was to assess the therapeutic management of T2DM patients, and on the precision that was expected. Based on the assumption that insulin was the least prescribed therapy in terms of proportions, the sample size was determined in order to establish the frequency of insulin-treated patients. It was estimated in a way to give an estimation of proportions with an absolute precision of 20% and a confidence interval of 95%.

The number and profile of the physicians to participate in the study was determined on a country basis. The number of physicians depended on the patients' sample size of each country. Considering that each physician was requested to enroll 10 T2DM patients, the number of physicians was the number of patients divided by 10.

In Lebanon, it was planned to select 80 sites and to recruit 1000 patients. A total of 115 physicians and 1571 patients were actually included in the analysis in 2006 and 77 physicians and 1159 patients in that of 2011.

Demographic, relevant medical history and biochemical data

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were obtained, analyzed and reported. The IMPDS 2006 data was already published in a separate paper [5]. This paper focuses on the data obtained from Lebanon about patients with type 2 diabetes, and is a descriptive comparison between the IMPDS data of 2006 (or 2008 when respective data not available) and 2011. Proportions are reported as percentages of whole included population, and means are reported as continuous variables ± standard deviations.

Results

In 2006 and 2011, the number of patients with type 2 Diabetes recruited was 1285 and 1059 patients respectively. The average population age was in the late fifties, and was equally divided by gender. The average BMI at inclusion was in the high overweight range in both 2006 and 2011 with a mean BMI of 29.04 ± 4.74 kg/m², and 28.92 ± 4.39 kg/m², respectively (Table 1).

Glycemic control

Regarding the glycemic control of the studied population, the mean fasting serum glucose decreased from 10.63 ± 4.06 mmol/L to 8.54 ± 3.49 mmol/L and their mean HbA1c decreased from 8.1% (65 mmol/mol) to 7.8% (62 mmol/mol) in 2011, with a higher proportion (36.1%) reaching the HbA1c’s target range <7% (53 mmol/mol) in 2011 when compared to 29.6% in 2006. When categorized by type of Diabetes treatment, it was found that the proportion of patients on oral hypoglycemics alone is stable at around 73% throughout the 5 years in between 2006 and 2011, whereas patients on Insulin therapy alone decreased from 7.5% to 3.6% and those on a combination of Insulin and oral therapy increased from 15.2% to 19.6% in 2006 and 2011 respectively.

Screening for diabetes complications

The screening for Diabetes complications, both micro-vascular and macro-vascular, by healthcare professionals seems to be improving and on the rise. Patients were questioned about being screened at least once for each different diabetic complication during the last year before recruitment and the results were reported. With regards to micro-vascular complications, it was found that in 2006, 53.2% of patients with type 2 Diabetes were screened for retinopathy while this proportion increased to 68.5% in 2011. The same applies for diabetic nephropathy and peripheral neuropathy, where the screening proportion rose from 63.4% to 86.7% and from 47.9% to 63.6%, respectively between 2006 and 2011. In parallel, the data shows that there is a decrease in the proportion of patients who were never screened for Diabetes complications and this was mostly the case for peripheral neuropathy screening, foot exams as well as diabetic nephropathy screen. In 2011, 95.5% of the recruited population had an assessment of a lipid panel in the last year prior to investigation and 77.1% of them were investigated for cardiovascular complications, whereas 78% and 60.5% were screened for hyperlipidemia and cardiovascular complications respectively, in 2006 (Figure 1).

Blood pressure control

When investigated for Blood Pressure (BP) control, 95.2% of patients were screened for hypertension in 2011 versus 89.2% screened in 2008 (data not available for 2006). In 2011, 43.7% of patients were found to have a Systolic Blood Pressure (SBP) in the target range of less than 130 mmHg whereas 35.9% of patients were in that SBP range in 2006. However, the overall mean BP was nearly unchanged over the years, 134.5/80 mmHg and 130.8/79.7 mmHg in 2006 and 2011, respectively. With regards to antihypertensive treatment, less patients were treated with Angiotensin Converting Enzyme Inhibitors (ACEI), 46.2% versus 36.2% whereas more patients were on Angiotensin II Receptor Blockers (ARB), 39.4% versus 50.1%, in 2006 and 2011 respectively.

Diabetes complications

Within the recruited cohort of patients with type 2 Diabetes in 2011, the mean duration of type 2 diabetes was 8.11 (±7.23) years, comparable to that in 2006 of 8.73 (±7.49) years. In 2011, around one third (30.3%) of the population had long standing diabetes, defined as more than 20 years, compared to 8.2% in 2006. When all Diabetes late complications were combined, 43.7% of patients were found to have at least one complication in 2011 which shows a decreasing trend from 2006 where this proportion was as high as 56%.

With regards to the patient’s fasting lipid profile, 39.3% of patients had an LDL <2.59 mmol/L and their mean fasting LDL was 2.90 ± 0.98 mmol/L, when compared to 30.9% and 3.85 ± 4.87 mmol/L in 2011 and 2006, respectively. In contrast, 39% of the type 2 diabetic population had a triglycerides level below 1.69 mmol/L in 2011, whereas 43.3% fell in that target range in 2006. The use of statin therapy increased from 74.2% in 2006 to 82.7% in 2011.

The use of anti-platelets therapy decreased from 2006 to 2011, from 60.6% to 45.7% (Table 1). More patients were found to be current smokers, with a proportion of 24.6% in 2006 and 27.2% in 2011, in parallel more patients quit smoking and were found to be ex-smokers, 13.1% and 18.2% in 2006 and 2011, respectively.

Discussion

The Lebanese population of patients with type 2 Diabetes, like other international populations with Diabetes, has a high rate of obesity and lacks proper lifestyle modifications. Ghassibeh-Sabbagh et al. recently reported a strong correlation between BMI and type 2 diabetes in Lebanese patients [5]. The lack of improvement of the mean BMI between the cohort of 2006 and that of 2011 indicates the poor compliance of patients to dietary restrictions and lifestyle modifications, as well as a possible lack of sufficient awareness and education offered to the patient by health care practitioners regarding the importance of these factors. Despite the stagnancy of weight status, there’s a slight improvement in the glycemic control of these patients with type 2 Diabetes, with more patients reaching the target HbA1c of less than 7% (53 mmol/mol) in 2011, yet the mean HbA1c of the 2 cohorts, albeit improving, is still far from the American Diabetes Association (ADA) recommendations and guidelines [6]. The use of insulin as the sole treatment strategy decreased from 2006 to 2011 and more patients were on a combination of insulin and oral hypoglycemic agents. This
was the case in spite of one third of 2011’s cohort having long standing Diabetes mellitus. This could be partly explained by the introduction of new hypoglycemic agents to the Lebanese market during that period of time, namely the incretins’ family, which have proven to stimulate endogenous insulin secretion and pancreatic β cell proliferation and action, thus decreasing patients’ insulin requirements. The ability of GLP-1 agonists to increase β-cell mass has been demonstrated in vivo and makes these agents attractive as a treatment choice for type 2 diabetes [7,8].

The improved screening rates for Diabetes complications in 2011 shows increased awareness of physicians of the importance of screening in prevention of late complications and prevention of poorer outcomes. The UKPDS study had shown that up to 25% of patients with type 2 Diabetes have already developed one or more micro-vascular complications of diabetes in Lebanon: Experience at the American University of Beirut. Diabetol Metab Syndr 6: 89.

Conclusion
In conclusion, this study comparing mainly 2 waves of the IDMPS, 2006 and 2011, shows a promising improvement in Diabetes management; however a national continuous effort is required. Treating physicians and care givers are becoming more aware of the importance of screening for diabetic complications nevertheless and despite all their efforts, the glycemic and metabolic control of the Lebanese type 2 Diabetes population is still suboptimal. Emphasis on educating the population about the importance of lifestyle modifications and obesity control will eventually improve type 2 diabetic patients’ outcomes.

References


