

Quality of Diabetes Annual Management in the Internal Medicine Department in Yalgado Ouédraogo Teaching Hospital, Ouagadougou

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Abstract

Introduction: The periodic management of diabetes improves disease's prognosis. We aimed to evaluate the quality of diabetes annual management and the effectiveness of its treatment in Ouagadougou. **Material and Method:** It was a cross-sectional and descriptive study, from retrospective records in the internal medicine department, Yalgado Ouédraogo Teaching Hospital (CHU-YO). Diabetic patient's (15 years old and more) files that were registered between January, 2012 and December, 2016 have been analyzed. Files containing less than 80% data were excluded. Data relating to the baseline characteristics of the patients, the therapeutic education dispensation, the clinical and paraclinical assessment of the initial and annual visits at the first year of patient's follow-up have been collected. The 2007 diabetes management standards of the French "Haute Autorité de Santé" as well as the biological standards of the same instance have been used. The quantitative variables were expressed as means and standard deviations and qualitative variables were expressed as absolute and relative frequencies. **Results:** 317 patients, including 218 women (68.77%) were studied. The mean age of women was 51.67 ± 12.46 years, and that of men 55.71 ± 10.63 . Diabetes was type 2 in 302 (95.26%) patients. The mean duration since the diagnosis of diabetes was 2.9 years. The completeness rate of therapeutic education at the annual visit was 10.46%. That of the clinical examinations was at best 38.17% and 44.23% for the measurement of weight and blood pressure; otherwise it was less than 5%. About the paraclinical data, apart from the measurement of the fasting blood glucose which completeness rate was 71.61%, that of the others exams were less than 10%. At the annual visit, the mean value of HbA1C was 7.5%, and the target for HbA1C was achieved in 47.90% patients. **Conclusion:** The

quality of diabetes annual management is unsatisfying. A structural improvement and the adaptation of guidelines are needed.

Keywords

Chronic Disease's Management, Diabetes, Sub-Saharan Africa

1. Introduction

The burden of diabetes mellitus is growing worldwide. The prevalence of diabetes mellitus was found to be more than 425 million cases in 2017, and is estimated to reach 629 million in 2045, with a greater progression in low-income countries [1]. The management of diabetes mellitus results from an agreement between the care team, the patient and his entourage, and is based on the recommended quarterly and annual follow-up, in order to improve diabetes prognosis. The implementation of the recommendations in the real life faces to constraints. For example, Peytremann *et al.* in 2013 in Switzerland [2], Le Gac in 2016 in France [3] related some deficiencies in the periodic screening of diabetes complications (the electrocardiography, the examination of feet and eyes were not done in most patients). Yaméogo in Bobo-Dioulasso (Burkina Faso) reported not only the lack of prescription by diabetes caregivers, but also the limited access to the diabetes annual paraclinical assessment [4]. In a recent publication, we also noted shortcomings in the quarterly monitoring of diabetic patients in the internal medicine department in Yalgado Ouédraogo Teaching Hospital (CHU-YO), Ouagadougou [5]. Given this previous findings, we hypothesized that the annual management of diabetes is like its quarterly management. This study was therefore designed to estimate the quality of the annual management of diabetes (in terms of completeness of the annual assessment) and the effectiveness of the anti-diabetic treatment in the internal medicine department, CHU-YO, Ouagadougou. The results of the study will be helpful for improving patient's management.

2. Material and Method

It was a cross-sectional and descriptive study, from a collection of patient's retrospective data. It has been carried out in the internal medicine department, CHU-YO, a tertiary national diabetes reference center. Diabetic patient's files that were registered in the center between January, 2012 and December, 2016 have been analyzed. Files containing less than 80% data were excluded. Data relating to the baseline characteristics of the patients (age, sex, residence, education and socio-professional status), the dispensation of therapeutic education, the clinical assessment (measurement of weight, height, body mass index and blood pressure, examination of eyes, feet, neurological, cardiovascular and stomatological systems) and the paraclinical assessment (measurement of fasting blood glucose, glycated hemoglobin (HbA1C), creatininaemia, lipids' fractions,

24-hour proteinuria, urine's cytobacteriology exam, and electrocardiography) of the initial and annual visits at the first year of follow-up have been abstracted from the patient's files. Any data that did not exist in the files was considered as not investigated by the physician and/or not provided by the patient. The guidelines for the diabetes annual management as well as the biological standards of the French "Haute Autorité de Santé" 2007 have been used for the study [6]. This instance recommends annually for diabetic patients, the measurement of the weight, height, body mass index and blood pressure, the examination of the eyes, feet, neurological, cardiovascular, and stomatological systems, the dosage of fasting blood glucose, HbA1C, creatininaemia, lipids' fractions, and microalbuminuria (not available and substituted in our practice by 24-hour proteinuria), the urine's strips tests (not performed in routine, and substituted in our practice by urine's cytobacteriology examination), and electrocardiography. In the study, the effectiveness of the management has been assessed only for diabetes balance, and the therapy was effective if HbA1C \leq 7% or fructosamine $<$ 300 μ mol/L. For the others clinical and paraclinical examinations and the dispensation of therapeutic education, the assessment of the quality of diabetes management consisted to determine the completeness rate in their annual achievement. Data have been analyzed, using an Excel and SPSS software (version 2.0). The quantitative variables were expressed as means and standard deviations and the qualitative variables were expressed as absolute and relative frequencies. Anonymity and confidentiality have been respected during data's collection.

3. Results

3.1. Patient's Baseline Characteristics

A total of 1887 patients were registered, and 317 have been included in the study, *i.e.* 218 females (68.77%) and 99 males (31.23%); the sex ratio was 0.45. The mean age of females was 51.67 ± 12.46 years old and that of males 55.71 ± 10.63 . The socio-demographic characteristics of the patients are reported in **Table 1**. Diabetes was type 2 in 302 (95.26%) and type 1 in 15 patients (4.74%). The mean duration since diabetes diagnosis was 2.9 years [1 - 25 years]; diabetes was newly diagnosed in 41 patients (12.93%).

3.2. Implementation of Recommendations

3.2.1. Therapeutic Education

The therapeutic education has been performed in 10.46% patients at the annual visit versus 49.83% at the initial visit.

3.2.2. Clinical and Paraclinical Assessments

Concerning the clinical assessment, apart from the measurement of weight and blood pressure which completeness rate exceeded 30% (respectively 38.17% and 43.21%), the completeness rate of the others clinical examinations (height, eyes, feet, neurological, cardiovascular, stomatological) of the annual assessment was

less than 5%, and less than 1% for the measurement of the body mass index. The completeness rate of the clinical assessment was lower at the annual visit, compared to the initial one (Table 2).

Table 1. Distribution of patients according their socio-demographic characteristics (N = 317).

		Total (n)	Percentage (%)
Gender	Male	99	31.23
	Female	218	68.77
Age (years)	[20 - 40[37	11.67
	[40 - 65[223	70.35
	≥65	57	17.98
Résidence	Urban area	216	68.13
	Other area	101	31.87
Education status	No schooling	61	19.24
	Primary	11	03.48
	Secondary	37	11.67
	Tertiary	08	02.52
	Not reported	200	63.09
Occupation	Farmer	14	04.42
	Housewife	107	33.75
	Employed	83	26.18
	Self-employed	70	22.08
	Others	43	13.57

Table 2. Comparative table of the frequency of diabetes clinical assessment at the initial and annual visits at the first year of patient's follow-up in the internal medicine department, CHU-YO (N = 317).

Clinical assessment	Initial visit n (%)	Annual visit n (%)
Weight	189 (59.62)	121 (38.17)
Blood Pressure	182 (57.41)	137 (43.21)
Height	101 (31.86)	NA
Body Mass Index	22 (06.94)	03 (00.95)
Feet examination	66 (20.82)	08 (02.52)
Neurological examination	65 (20.50)	09 (02.84)
Cardio-vascular examination	60 (18.93)	04 (01.26)
Stomatological examination	53 (16.72)	04 (01.26)
Eyes examination	81 (25.55)	13 (04.10)

NA = inapplicable.

Concerning the paraclinical assessment, apart from the measurement of the fasting blood glucose and HbA1C/Fructosaminemia which completeness rates were respectively 71.61% and 57.41%, the completeness rate of the others exams (creatininaemia, lipids' fractions, 24-hour proteinuria, and electrocardiography) was less than 10%, and less than 1% for the urine's cytobacteriological exam. The completeness rate of the paraclinical exams was lower at the annual visit compared to the initial one (Table 3).

3.3. Effectiveness of Anti-Diabetic Treatment

At the annual visit, the fasting blood glucose was normal in 127 out of 227 patients (55.94%), the target of HbA1C was achieved in 80 out of 167 patients (47.90%) and fructosaminemia was normal in 10 out of 15 patients (66.66%). The mean value of HbA1C was 7.5%.

4. Discussion

The study has been designed to estimate the performances of the internal medicine department in the implementation of the guidelines for diabetes annual management and the effectiveness of the anti-diabetic treatment at the first year of follow-up. The results highlight an unsatisfying completeness rate of the diabetes annual clinical and paraclinical assessments and an acceptable effectiveness of the treatment.

The completeness rates of the diabetes annual clinical and paraclinical assessments were in general poor. They hardly exceeded 10%, except the measurement of weight, blood pressure, HbA1C/Fructosaminemia and fasting blood glucose. The performances were lower, compared to the initial visit. As we have

Table 3. Comparative table of the frequency of diabetes paraclinical assessment at the initial and annual visits at the first year of patient's follow-up in the internal medicine department, CHU-YO (N = 317).

Paraclinic assessment	Initial visit n (%)	Annual visit n (%)
Fasting Blood Glucose	309 (97.48)	227 (71.61)
HbA1C/Fructosaminemia	NA	182 (57.41)
Urine's Cytobacteriology Exam	19 (05.99)	01 (00.31)
24-hour Protéinuria	94 (29.65)	15 (04.73)
Creatininaemia	123 (38.80)	29 (09.15)
Total Cholesterolemia	130 (41)	28 (08.83)
LDL Cholesterolemia	117 (36.91)	23 (07.25)
HDL Cholesterolemia	122 (38.48)	24 (07.57)
Triglyceridemia	112 (35.33)	20 (06.30)
Electrocardiography	59 (18.61)	12 (03.78)

HbA1C = Glycated Hemoglobin; NA = inapplicable.

suggested in our previous study relating to the quarterly monitoring of diabetic patients in the same center [5] and as Yaméogo has reported in her paper about the evaluation of the knowledge of health care workers on diabetes in Bobo-Dioulasso [4], material, financial, and structural limitations in the management of diabetes as well as the lack of knowledge of the guidelines for diabetes management and/or their importance by some diabetes caregivers could explain these findings. About the diabetes paraclinical assessments, the deficiencies could also be explained because, in the daily practice, the diabetes caregivers are often obliged to share out the annual assessment on subsequent visits, given the financial limitations of patients. Indeed, the charges of a normal package of diabetes annual paraclinical assessment lead sometimes the patients to interrupt their follow-up (there is no insurance system in Burkina Faso). But, this financial barrier could be reduced and the performance of the center increased by optimizing the prescription of exams. For example, the less expansive urine's strips tests may be requested instead of the urine's cytobacteriology examination. The gap in performance between the annual and the initial clinical and paraclinical assessments of diabetes reflects a decline in the quality of the diabetic patient's follow-up.

The mean value of HbA1c was 7.5%, similar to the results in Peytremann and al. [2] and Senz and al. [7] studies about respectively the evaluation of the diabetes management and the evaluation of the quality of life of type 2 diabetic patients (7.7% and 7.3% respectively). This is an acceptable outcome of the anti-diabetic treatment, an HbA1c \leq 7% target is recommended for most diabetic patients by the "Haute Autorité de Santé" [8]. An HbA1c \leq 7% was achieved in 47.90% patients when this exam was undertaken. However, a sub-population's analysis would allow a better interpretation of this parameter, because the target is individual and must be related to many characteristics of the patients.

About the methodological proceedings, the study had some limitations which must be taken into account in the interpretation of the results. First, due to the contents of patient's files and the lack of fields to fulfill, clinical and paraclinical domains are sometimes investigated by the caregivers, but are not recorded. The audit considering only the data in the file, this could lead to underestimating the real performance of the center in the implementation of the recommendations for diabetes monitoring. In the future reviews, this limitation could be better excluded through an observational study. The second limitation is related to the high rate of files not included in the study, which reduces the statistical power of the results and makes them not representative of all diabetic patients. The inclusion rate could have been improved by recalling patients to complete some data.

5. Conclusion

The performances in the implementation of the guidelines for diabetes annual management in the internal medicine department in CHU-YO are unsatisfying. A prospective study would help to explain shortcomings and determine the share

of responsibility of diabetes caregivers, patients and the health system. Taking into account the daily diabetes management in Burkina Faso, structural adjustments as well as the adaption of the guidelines for diabetes management are needed to improve diabetes care in our local health system.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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