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Antidiabetic Prescriptions at the University Hospital Center of Libreville (Gabon) Facing the Concept of Therapeutic Inertia: An Andragogical Perspective

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Abstract

Context: Diabetes mellitus is experiencing an alarming progression throughout the world, but more and more drugs are available with the use not always adapted. The aim of this work is to analyze the anti-diabetic prescriptions at the university hospital center of Libreville (Gabon) and confront them with the concept of therapeutic inertia. Patients and Methods: In diabetics coming for their periodic control, we transcripted for 2 months, beyond their characteristics, their glycated hemoglobin rate and the treatment followed. Results: 200 patients have consulted and among them, 160 (80%) had done their A1c analysis. 46% had an A1c ≤ 7% and 54% above with sometimes an unsuitable treatment evoking therapeutic inertia, the factors of which we discuss. Conclusion: Therapeutic inertia is a multifactorial problem, one of the components of which may be the resistance to change of the adult learners who are the practitioners.

Keywords

Anti-Diabetic Prescriptions, Libreville (Gabon), Therapeutic Inertia, Andragogy

1. Introduction

Diabetes mellitus, a state of chronic hyperglycemia due to multiple causes, is experiencing an alarming progression in the world considered as epidemic [1]. Previous epidemiological studies including DCCT [2] and UKPDS [3] have

shown the importance of a good glycemic control by appropriate treatment to prevent chronic degenerative complications. Therapeutic guidelines are established by various academic societies [4] [5] [6], but are not always correctly followed and the concept of therapeutic inertia initially expresses dichotomy between recognition, identification of a problem and no action to correct it [7]. According to other authors, this concept corresponds with the delay in the intensification of treatment in case a disease is not sufficiently controlled [8] [9]. What is the extent of the problem? This is a general problem encountered even in centers considered excellent in both clinical practice and training, according to Phillips [7]. This clinical inertia is found both in western and developing countries, as we can see from the following examples: in France, the DI attitude [10] survey, showed an intensification of treatment only in 39% of patients who needed it. In UK, a large study including more than 80,000 patients [11] showed an average time to intensify treatment by adding a second oral hypoglycemic agent (OHA) ranging from 2.9 to 1.6 years in patients with HbA1c between 7% and 8%. The average time to add a third OHA ranged from 7.2 to 6.9 years. And the average time to switch to insulin was about 6 years. In USA, the average time to intensify treatment was about one year in patients for whom metformin monotherapy had failed [12]. In Algeria [13], a study of 283 Type 2 diabetic patients showed therapeutic inertia for 67.5% of them. Consequences are not negligible for the deleterious effect on the glycemic control of patients [10] [14].

The aim of this work is to analyze the anti-diabetic prescriptions in diabetic patients followed externally at the University Hospital Center of Libreville (CHUL), confront them with the concept of therapeutic inertia, and finally propose other approaches to explain this phenomenon, especially andragogy which is interested in adults learning [15].

2. Materials and Methods

It was a cross-sectional prospective study conducted at the CHUL in October-November 2016 to evaluate the quality of glycemic control of patients by the measurement of HbA1c, referring to the treatment followed by these patients. For each patient coming for his periodic control, we noted the HbA1c level and the treatment followed, in addition to his characteristics. Criteria of inclusion: any patient coming for his periodic control. Criteria of exclusion: after analysis of collected data we rejected files without HbA1c values. HbA1c tests were done in private or public laboratories, as usually, according to the patient's choice. The CHUL' laboratory uses the high performance liquid chromatography (HPLC) technique, but there is often shortage of reagents. Private laboratories use immunological techniques. Patients were informed their data will be used anonymously for a study with the authorization of the CHUL' direction.

3. Results

Two hundred patients were registered including 126 women (63%) and 74 men

(37%). HbA1c analysis was done for 160 patients. Mean age 57.92 years ± 12, 19 (range 21 to 91). Average duration of diabetes is 7.14 years ± 6.84 (range 1 month to 36 years). Results classified in 3 categories according to the level of HbA1c. Group 1, HbAc ≤ 7% is the level wished for majority of patients, group 2, 7% < HbA1c < 8% is a rate acceptable in certain conditions and group 3 HbA1c > 8% reflects poor glycemic control [5]. Group 1 HbA1c ≤ 7%: 74/160 (46.25%), group 2 between 7.1% and 8%: 30/160 (18.75%) and group 3 HbA1c > 8%: 56/160 (35%). This is shown in **Figure 1**.

Treatment according to the HbA1c classes

Group 1. OHA 59 (79.75%) of which metformin alone 29 (39.18%), metformin + sulfamide 19 (25.67%). Insulin alone, 8 (10.8%), insulin + OHA 4 (5.40%).

Group 2. OHA 21 (70%). Metformin alone 3 (10%), metformin + sulfamide 14 (46.6%). Insulin alone 3 (10%), insulin + OHA 3 (10%).

Group 3. OHA 29 (51.78%). Metformin alone 8 (14.28%), metformin + sulfamide 16 (28.75%). Insulin alone 12 (21.43%), insulin + OHA 12 (21.43%).

Summary of treatment, see **Table 1**.

4. Discussion

Good glycemic control (Hb A1c ≤ 7%) was found in about 46% of diabetic patients followed externally, 80% of whom have done their HbA1c test before coming to control. Our results are very different from what is found in most sub-Saharan African countries where the situation is considered worrying [16]. In a multicenter study in West Africa [17], only 21% of patients had done their HbA1c test; the average of this HbA1c was 8.9%, compared to 7.7% in our series and 74% of patients were poorly balanced. In Congo, Makulo *et al.* [18] found an average HbA1c level of 9.14% ± 2.7%. How can the results of Gabon be explained? Gabon is a small country and 2/3 of the population lives in Libreville the capital where the offer of care is diversified and the role of the National Health Insurance and Social Security Fund (CNAMGS) which covers medical cares at 80% is undeniable. However, these results concern the urban environment and we do not know what is happening in rural areas. Despite these encouraging results, more than half of patients (54%) are unbalanced. Reasons can be multiple including the problem of therapeutic adherence that we found in 41% of Gabonese diabetics [19] and probably a lack of therapeutic intensification. Indeed, considering their treatment, the OHA were the most prescribed respectively in 80%, 70% and 51% of the patients of the 3 groups with firstly metformin respectively in 39%, 10% and 14% of the cases. Metformin therefore remains the basis of treatment in accordance with the guidelines and the intensification of treatment is essentially by addition of sulfamides which were proposed as 2nd choice [4] but are no longer recommended as the second favorite choice in recent guidelines [5] [6]. Other classes of OHA are little used and there is triple therapy only in 5.35% of cases in the most unbalanced patients, contrary to the guidelines. The use of insulin increases with the glycemic imbalance

sometimes alone, sometimes in intensification in addition to ADO. So, the analysis of these prescriptions shows a certain therapeutic inertia, but it can be debated because the choice of sulfamides in 2nd line is probably owed to a long use of these products with rather reassuring studies as ADVANCE for Gliclazide [20]. There are also economic arguments because they are cheap. Despite all the side effects attributed to them: cardio vascular, weight gain, hypoglycemia and increased mortality in diabetics [21], prescription of sulfonylurea hypoglycemic agents resists but declines in many countries, competed with other classes of oral antidiabetic drugs [6] [22].

Factors incriminated to explain this inertia concern doctors, patients, and the system of care. We have summarized them in **Table 2** which reports the point of view of different authors [7] [8] [13].

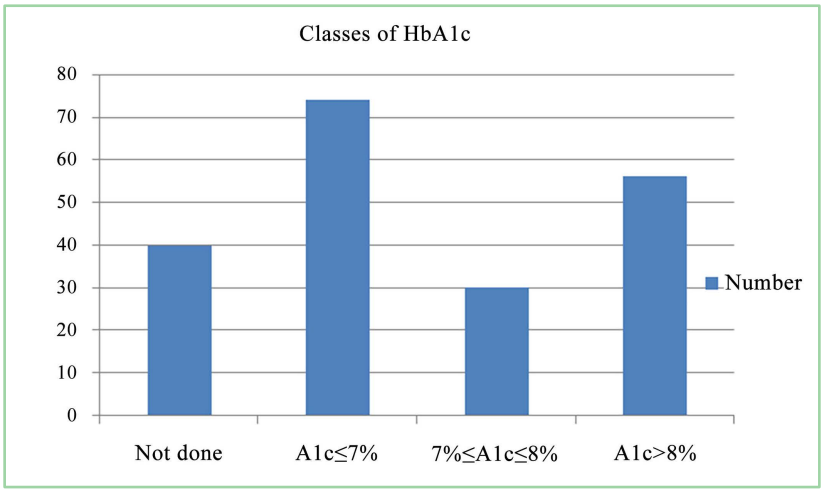

Figure 1. Distribution of HbA1c rates by class.

Table 1. Summary of prescriptions.

Treatment	HbA1c ≤ 7%	HbA1c 7.1% - 8%	HbA1c > 8%
OHA	79.75%	70%	51.78%
Metformin alone	39.18 %	10%	14.28%
Met + Su	25.67 %	46.6%	28.57%
Met + IDPP4	4.05 %	3.3%	
IDPP4 alone	2.7 %	3.3%	
Sulfamide alone	8.10 %	3.3%	
IAG		3.3%	3.57%
Met + IAG			
Met + Su + IDPP4			3.57 %
Met + su + IAG			1.78 %
OHA + insulin	5.40%	10%	21.42%
Insulin alone	10.8%	10%	21.42%

Legend: OHA = oral hypoglycemic agent. Met = metformin. Su = sulfamide. IDPP4 = Inhibitors of dipeptidyl peptidase 4. IAG = alpha glucosidase inhibitors.

Table 2. Factors of therapeutic inertia.

Author	Physician-related factors	Patient-related factors	Care system related factors
Phillips *et al.* 2001	Overestimation of care provided Soft reasons Lack of education, training not centered on therapeutic goals Lack of familiarity with guidelines	Lack of enthusiasm for management of asymptomatic problems Previous experiences of drugs side effects	Bad training to medical practice
Scheen & Giet 2010	Overestimation Knowledge problems ignorance or/and disagreement or/and complexity of recommendations	Adherence problems Too much medications and fear to add another drug	Solo medical practice
Kalafate *et al.* 2015	44.5% do not examine patients 25% do not adapt treatment	No following of lifestyle recommendations Cognitive disorders Side effects fear Disease denial Lack of confidence in physician	Bad organization of medical visits

Remediation solutions were proposed [7] [8] but with mixed results and even interventional educational approaches like the "Act on Threes" [23] failed to overcome this therapeutic inertia. This led us to consider the andragogical concept of "resistance to change" [24] which is one of the characteristics of the adult learner. Indeed, according to the principles of andragogy, the adult learner is characterized by 1) his autonomy and his self-direction in his learning choices. 2) His need to understand why he has to undertake a new apprenticeship. 3) He has his professional experience which can be an obstacle to a new learning if it is not challenged. 4) He has a readiness to learn if he feels the need, 5) by an internal motivation rather than external pressures, 6) he needs to see the immediate application of what he learns [15] [25]. All these characteristics make the adult less receptive to change, especially if he receives contradictory information about a new product such as increased risk of amputation under SGLT2 inhibitors [26]. This leads to caution in prescribing this category of oral antidiabetic drug. Therefore it is not "stigmatization" [9] that can influence the practice of a doctor but rather the consideration of andragogical principles: Valuing the physician, adult learner, experience, while leading him to "change his view" [27] on his own practice, on the other, the patient he cares for and on the others the medical world to which he belongs, evolution of knowledge and practices. This is the interest of continuous interactive training, communities of practice found in medical practice groups, the fight against "solo" exercise [8], which unfortunately still predominates in our sub-Saharan African countries.

5. Conclusion

The analysis of antidiabetic prescriptions in Libreville shows a therapeutic in-

adequacy in unbalanced patients, despite the availability of drugs. It's partially due to therapeutic inertia, a multifactorial phenomenon found all over the world, whose understanding can be enlightened by the andragogical characteristics of the adult learner.

Conflicts of Interest

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

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