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Original article

Barriers to insulin initiation in elderly patients with type 2 diabetes mellitus in Brazil

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ABSTRACT

Aims: We aimed to explore insulin initiation barriers in the Brazilian Type 2 Diabetes Mellitus (T2DM) elderly population, according to the physician's perspective, and suggest strategies to overcome them. **Methods:** A 45-questions survey addressing issues as clinical characteristics, barriers to insulinization, and treatment strategies in elderly patients with T2DM, was sent to six endocrinologists from different Brazilian locations. Thereafter, all the respondents participated in a panel discussion to validate their responses and collect additional relevant data.

Results: Endocrinologists had at least 15 years of experience, with a mean of 63 elderly patients per month. Nearly 25% of the elderly patients were treated in the Brazilian public healthcare system (SUS, Unified Health System); only a quarter presented proper glycemic control. In contrast, 55% of the patients from private healthcare system presented adequate glycemic control. The main barriers for insulin initiation for patients, according to physicians' perspective, are side effects and negative perception over treatment (100%). For endocrinologists, main barriers were lack of time to guide patients and concern over side effects (83%). Therefore, specialists considered education for both healthcare professionals and patients as one of the most important strategies to circumvent the current scenario related insulin therapy among elderly patients in the country.

Conclusion: Insulin therapy remains underused due to several barriers, such as concern over side effects and negative perception. Educational measures for patients and HCPs could improve the current scenario.

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1. Introduction

The elderly Type 2 Diabetes Mellitus (T2DM) patients are an emerging population in Brazil, due to increasing trend of T2DM and aging of the population [1,2]. In 2015, more than a half of diabetes-

related deaths in south and central America occurred in the population >60 years [1]. In order to avoid diabetes-related complications, the American Diabetes Association (ADA) recommends the treatment with oral antidiabetic drug (OAD), followed by the addition of another OAD or basal insulin, if the HbA1c normal level ($\leq 7\%$) is not achieved [3]. Insulin therapy has proven to be a good and safe alternative in the management of diabetes, if carefully managed [4,5]. In a study comparing different therapy strategies for newly diagnosed T2DM, it was observed that more patients achieved glycemic targets in less time in the OAD + insulin group than the group treated with OAD alone; and, one year after therapy cessation, the OAD + insulin group showed better glycemic

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control without any drug therapy [6]. The possible reason for the prolonged effect over glycemic levels might be the insulin protective action over pancreatic beta cells, which reverts glucolipototoxicity effects and prevents beta-cell overstimulation [7–9]. In addition, there are data showing that insulin treatment is more effective to achieve target glycemic levels among elderly patients [10].

Even though insulin therapy presents beneficial effects, most of healthcare professionals (HCP) tend to delay the therapy initiation. Such behavior apparently hides a complex scenario, driven by different factors related to HCPs, patients and local regulations [11]. Concern over hypoglycemia and weight gain, inconvenience of administration, negative perception on insulin therapy, and lack of communication between HCP and patient are the most commonly mentioned barriers [12–15].

Some of these barriers may be aggravated when the treatment involves elderly patients. For instance, the ACCORD study showed that elderly T2DM patients are more likely to have hypoglycemic episodes [16]. The decreased renal function, slower hormonal counter-regulation, nutritional issues, and other situations, increases the chances of having treatment side effects [17]. Therefore, ADA recommends individualized treatment depending on patient's comorbidities, with less stringent standards for T2DM management (HbA1c <8%) in some cases [18]. In this complex scenario, the aims of this study are to explore the main barriers for insulin initiation in the Brazilian T2DM elderly population, according to the physician's perspective, and to suggest strategies to overcome current barriers.

2. Subjects, materials and methods

This descriptive cross-sectional panel study was divided mainly in two steps: the questionnaire (survey) and the panel discussion. They were developed in order to understand, identify and describe the barriers for insulin initiation, from the physician's perspective, in the elderly (≥ 60 years) diabetes population from Brazil. Six endocrinologists, with extensive previous experience in T2DM and insulin therapy, were selected to participate in the study in 2016. They were from private and public health institutions and university in Brazil, representing Southeast and Midwest regions, therefore they were all involved in the care of patients from the public and private healthcare systems. No ethics approval and informed consent to participate were necessary as there were no patients participating or real patients' data in this study.

A questionnaire was sent to each physician to be completed according to their individual experience and perspectives, after they consented to participate in the discussion panel. Subsequently, an in-person panel discussion with all six physicians was scheduled to validate their opinions and to debate the barriers for insulin therapy initiation and possible strategies to overcome barriers. The questionnaire results were presented to all physicians and all topics were then subjected to debate, during the panel.

2.1. Questionnaire development

A survey with 45 questions was developed by specialists based on the main barriers for insulin initiation found in the literature; the questionnaire was validated by an internal endocrinologist. Then, the questionnaire was sent by electronic mail directly to 6 physicians and it was responded within two weeks days. The main topics of the questionnaire were extracted from a literature review and aimed to identify the barriers for insulin therapy initiation, the patient's and treatment's profiles, and to generate strategies and suggestions to improve the Brazilian current scenario.

The questionnaire, containing multiple-choice and three open questions, was divided into three main topics:

- Physician and patients' characterization: specialty; experience time; mean number of T2DM patients seen per month; mean number of elderly T2DM patients seen per month (≥ 60 years); criteria and length of time until insulin therapy initiation on elderly patients.
- Characterization of elderly T2DM patients in public and private healthcare systems: number of patients from each healthcare systems and number of visits per year; amount of patients under adequate glycaemia control (from physician's perspective as the values varies according to patient's health status); patients treated with insulin; most common types of insulin and devices used; and lines and duration of treatment for T2DM.
- Barriers and strategies: the physician was asked to describe the barriers for insulin initiation in elderly T2DM patients; whether or not elderly patients had better acceptance and benefits related to insulin treatment compared to younger patients; and to propose suggestions for improvement of the current scenario.

No measures had to be taken regarding missing data or response rates, because all participants responded all questions.

2.2. Panel meeting

The six specialists were invited to participate in a panel discussion. Approximately one week after sending the filled questionnaire, a meeting took place in Sao Paulo and the participants were able to comment on and validate their answers, share their experiences and discuss the difficulties involved in the insulin therapy and what measures should be considered to overcome these barriers in the Brazilian scenario.

2.3. Data analysis

Questionnaire responses were extracted, with counting/ranking for those related to multiple-choice and categorization for those related to open questions. Subsequently, frequency analyses of all responses were performed in order to summarize results, with descriptive purposes only. All results are reported as rate of respondents with multiple choices for several questions.

3. Results

3.1. Participant's characteristics and experience

Six endocrinologists answered the questionnaire with 45 questions. All participants had at least 15 years of experience in the treatment of T2DM; one third of them had 30 years of experience. The endocrinologists had a mean of 112 patients per month, and a little more than half of them were elderly (63 patients/month), corresponding to approximately 380 patients seen each month. Most elderly patients have had the disease for 5 to 10 years, with a mean of 7 years. All participants reported uncontrolled glycemic levels as the main criterion for insulin initiation. Curiously, different levels of HbA1c, ranging from $\geq 7.5\%$ to $\geq 9\%$, were mentioned by the physicians when reporting criteria to start insulinization. Some of them also mentioned complementary criteria such as weight loss, weakness, lack of response to first line OAD therapy, and muscle mass reduction. After physicians have detected the need for treatment with insulin, the length of time for initiation varied according to physicians: 2 of them reported starting before 2 weeks, 3 of them from 2 to 4 weeks, and one waited until 2 months for starting it. Table 1 shows the most common types of insulin from both healthcare systems.

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