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Original article

Relationship between achieved personalized glycaemic targets and monitoring of clinical events in elderly diabetic patients

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Abstract

Aim. – Recent guidelines for the management of type 2 diabetes (T2DM) in the elderly recommend adjusting the therapeutic target (HbA_{1c}) according to the patient's health. Our study aimed to explore the association between achieving the recommended personalized HbA_{1c} target and the occurrence of major clinical events under real-life conditions.

Methods. – The T2DM S.AGES cohort was a prospective multicentre study into which 213 general practitioners recruited 983 non-institutionalized T2DM patients aged > 65 years. The recommended personalized HbA_{1c} targets were < 7%, < 8% and < 9% for healthy, ill and very ill patients, respectively. Major clinical events (death from any cause, major vascular events and/or hospitalization) were recorded during the 3-year follow-up. Mixed-effects logistic regression models were used for the analyses.

Results. – Of the 747 patients analyzed at baseline, 551 (76.8%) were at their recommended personalized HbA_{1c} target. During follow-up, 391 patients (52.3%) experienced a major clinical event. Of the patients who did not achieve their personalized HbA_{1c} target (compared with those who did), the risk (OR) of a major clinical event was 0.95 (95% CI: 0.69–1.31; $P = 0.76$). The risk of death, major vascular event and hospitalization were 0.88 (95% CI: 0.40–1.94; $P = 0.75$), 1.14 (95% CI: 0.7–1.83; $P = 0.59$) and 0.84 (95% CI: 0.60–1.18; $P = 0.32$), respectively.

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Conclusion. – Over a 3-year follow-up period, our results showed no difference in risk of a major clinical event among patients, regardless of whether or not they achieved their personalized recommended HbA_{1c} target. These results need to be confirmed before implementing a more permissive strategy for treating T2DM in elderly patients.

Keywords: Cohort; Diabetes; Elderly; Major vascular event; Therapeutic target

1. Introduction

Diabetes is increasing in prevalence worldwide mainly because of the rise in obesity and ageing of the population [1,2]. It has an estimated prevalence of 15% in people aged > 65 years in the US [3]. As with the rest of the world, the estimated prevalence figures in France are similar: 14% in 65-year-olds and rising to 25% in those aged > 75 years [4,5]. Despite such a high prevalence in the Northern countries and its associated cardiovascular risk [6], the therapeutic management of type 2 diabetes mellitus (T2DM) is based on only a few randomized trials [7–9] which included few elderly patients, although such patients have a greater risk of not only cardiovascular complications, but also of drug-induced iatrogenic effects [5,10]. In fact, the benefit–risk balance of oral antidiabetic treatments has recently been questioned particularly in the elderly [11–13]. As a result, guidelines from the American Diabetes Association and European Association for the Study of Diabetes have been made more flexible, and are moving in the direction of personalization of treatment and glycaemic targets [14]. These guidelines vary in the elderly depending on the patient's health: glycaemic control should be stricter the longer the life expectancy.

The French Haute Autorité de santé (National Health Authority) produced new guidelines in January 2013 particularly for general practitioners (GPs), who are the leading health professionals in charge of diabetic patients both in France and in other countries, too. In view of the lack of controlled clinical studies on morbidity and mortality, and the small number of studies comparing different treatment strategies with each other, these guidelines were based mostly on expert opinion. They stated that glycaemic targets (defined by the HbA_{1c} as a percentage) in the elderly should be < 7% for healthy patients, < 8% for ill patients and < 9% for very ill patients [15]. The impact of these recent guidelines, however, has not been assessed.

Thus, the aim of the present work was to study, in T2DM patients aged ≥ 65 years and followed-up in general practice, the association between the achievement of their personalized therapeutic targets, as recommended by the French National Health Authority, and the risk of major clinical events.

2. Population and methods

S.AGES was a prospective multicentre, non-interventional cohort study conducted in France to describe the medical and paramedical care of ambulatory older patients under real-life conditions [16,17]. Briefly, S.AGES included French men and women who were ≥ 65 years of age, covered by the French national social security system and being treated for T2DM. Patients were not included if they were residents of a nursing home, taking part in another clinical trial, could not be monitored after inclusion or had a short life expectancy. The intended follow-up period was 3 years, with a clinical visit every 6 months.

The study was approved by the relevant ethics committee and the French National Agency for Medicines and Health Products Safety (ANSM). The clinical trial reference of this study is NCT01065909. All patients signed the informed consent form to participate.

2.1. Data collection

At the inclusion visit, the participating GPs collected data on the participating patients' demographic and lifestyle characteristics, medical and paramedical management, cognitive and mood status [18], information from clinical examinations, past history and comorbidities, diabetes history and its complications, serum creatinine [19], glycated haemoglobin (HbA_{1c}) and treatments. During the follow-up visits, the GPs recorded the same information together with clinical events, hospitalizations and deaths.

At inclusion and during follow-up visits, each patient's health was defined by a score — adapted from the Short Emergency Geriatric Assessment (SEGA) [20] — which included the following variables categorized according to a grade of 0, 1 or 2: age < 75 years, 75–85 years or > 85 years; number of medications taken daily ≤ 3, 4–5 or ≥ 6; living environment at home with no outside help, at home with others for assistance or in residential accommodation; mood assessed by the physician as no depression, past history of depression or current depressive state; cognitive function as normal [Mini-Mental State Examination (MMSE) [21] score > 27], slightly reduced (MMSE score: 10–27) or reduced (MMSE < 10); falls over the previous 6 months as no falls, 1 fall or ≥ 2 falls; nutritional status as a body mass index (BMI) 20–25 kg/m^2, 26–40 kg/m^2, or < 20 or > 40 kg/m^2; Instrumental Activities of Daily Living (IADL) score [22] of 4 (independent), < 4 and > 0 (requiring partial assistance) or 0 (incapacity); walking as independent, requiring support or incapacity; continence as continence, occasional incontinence or permanent incontinence; and eating as independent, requiring partial assistance or dependent.

Patients were also classified into three groups based on their data at each visit: healthy if their score was < 7; ill if their score was 7–10; and very ill if their score was > 10.

In addition, the main exploratory variable — achieving their therapeutic target — was defined based on the French National

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