CLINICAL GERIATRICS - REVIEWS

Characteristics that influence the diagnosis and treatment of diabetes in geriatric patients over 75

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1. RECOMMENDATIONS

All geriatric DM patients can benefit from a clinical evaluation that:

A. includes a thorough Comprehensive Geriatric Assessment with an evaluation of different functions and level of functional independence (or disability/dependency) using standardized and quantifiable assessment scales (see section 7 for more details). This evaluation should be repeated at least every six months to allow the healthcare provider to observe changes in performance on the individual scales and monitor disease progression, and/or the efficacy or harm of any interventions (e.g., effects of drugs on cognitive and motor functioning);

B. prioritizes functional outcomes. Functional decline in geriatric patients is a marker of dependency /disability risk, but it can also be used as an integrated marker of health status and is an objective indication of treatment effectiveness. Often, one of the main goals of treatment for geriatric patients is to preserve remaining functions and to delay the onset of disability by slowing functional decline [1,2]. Intact functions should also be assessed to establish the patients' ability to self-manage as a part of their care process [3]. Conventional approaches where treatment goals mainly focus on outcomes directly related to the disease have proved to be insufficient and sometimes harmful [4]. Functional outcomes should be the primary objectives when setting and prioritizing treatment goals for geriatric DM patients. Clinical trials have proven this approach to be feasible and effective [5];

C. reviews the quality of clinical evaluation and indicators of quality of care. This should include regular, planned monitoring of cardiometabolic risk factors (HbA1c, arterial pressure, LDL cholesterol, and eye fundus) also including personalized functional outcomes - i.e., "weighted" according to patient and caregiver health priorities, comorbidities, social and economic situation, and life expectancy [6,7]. In other words, the results of the Comprehensive Geriatric Assessment are a key aspect of the decision-making process for geriatric DM patients, which help to ensure that treatment is fully personalized.

2. STRENGTH OF THE RECOMMENDATIONS

The quality of the evidence is moderate. Recommendations are supported by published evidence.

3. SUPPORTING EVIDENCE

See appendix.

4. AREAS OF UNCERTAINTY AND FUTURE PERSPECTIVES

A. Larger studies with adequate follow-up to identify the benefits of different therapeutic strategies based on functional outcomes rather than only conventional cardiometabolic outcomes.
B. Production and validation of empowerment tools for geriatric DM patients with specific functional deficits is needed.

APPENDIX

The prevalence of DM increases with age: more than 25% of people aged over 65 have diabetes [8]. In geriatric DM patients it is important to consider that there may be an interaction between the aging process, DM, and length of exposure to DM (increased number of years living with DM). Despite variations between the different populations studied in the scientific literature, most research has shown a higher risk of cardiovascular disease, dementia, cancer, infections, etc, in persons with DM, often also in geriatric DM patients. However, there is currently no clear picture of the exact prevalence of multimorbidity in geriatric DM patients. In the current chapter, we will describe the typical profile of geriatric DM patients (aged 75 or older).

Geriatric DM patients often have multiple diseases. It is important to focus on the concept of multimorbidity, which emphasizes the complexity of the patients, their treatment, and related outcomes. In contrast, the definition of comorbidity focuses on the presence of numerous diseases that need to be managed by various specialists and centers around an index disease, i.e., the one that has the most influence ion the patient's health status. However, in geriatric patients the index disease tends to vary over time and, thus, the concept of multimorbidity is more appropriate because it takes into consideration changes in the relative influence of various diseases that interact in influencing health status.

The prevalence of ischemic heart disease, peripheral artery disease, and amputations in geriatric DM patients is high. More than 30% have stage 3 chronic kidney disease [9]. Multiple sensory deficits (such as visual, auditory, peripheral neuropathy sensations/symptoms) are common and, according to some reports, occur in more than 50% of geriatric DM patients [10]. These multiple sensory deficits are associated with clinically significant impairments in balance and gait as well as a high risk of falls and an increased risk of hip fracture, particularly in women [11]. Motor deficits in geriatric DM patients affect the number of years lived with disability (YLD), more than stroke, ischemic cardiomyopathy, or kidney failure [12]. Heart failure is also an increasing problem in geriatric DM patients: the population-based Reykjavik study [13] reported a prevalence of 16% in men and 22% in women, while RCTs report a prevalence ranging from 10 to 30% in geriatric DM participants [14]. DM is associated with a significantly higher risk of developing cancer (colorectal, breast, bladder, liver, pancreas, endometrial [15]) while depression and dementia affect approximately 21 and 24% of geriatric DM patients, respectively [16].

The combination of the above-mentioned diseases can have an impact of the treatment of geriatric DM diabetes, often causing iatrogenic injury. This phenomenon is referred to as 'therapeutic competition', i.e., treatment for one condition may adversely affect a coexisting condition (e.g., NSAIDs for osteoarticular pain in a patient with heart failure, beta-blockers for heart failure and decreased reaction to hypoglycemia, etc). Therapeutic competition occurs in about a quarter of older people [17].

The standard management approach for geriatric DM patients often does not suitably meet the needs of patients ('unmet needs'), who have multiple combinations and severity levels of the above-mentioned diseases, which leads to considerable heterogeneity in clinical presentation and complexity for patient management [3]. When DM is the principle disease, it can be useful to classify diabetes-related disorders into concordant and discordant comorbidities [18,19]. Concordant comorbidities (e.g., pulmonary arterial hypertension, coronary disease, arrhythmia, stroke) share some risk factors and common management strategies with DM. In contrast, discordant comorbidities (e.g., arthrosis, depression, dementia, COPD, cancer, recurrent infections), do not appear to be directly related to DM pathophysiology and can even increase the complexity of DM management and clinical decision-making. Indeed, discordant comorbidities are often not evaluated or documented in geriatric DM patients' medical records.

Conflict of interest

The Author declares no conflict of interest.

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This statement is:	Quality of the evidence (in the case of recommendation):
☒ **Recommendation** (supported by published evidence) ☐ Best practice (supported by expert opinion)	☐ Low ☒ **Moderate** ☐ High