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Potential Overtreatment of Older, Complex Adults With Diabetes

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Abstract

IMPORTANCE—In older adults with multiple serious comorbidities and functional limitations, the harms of intensive glycemic control likely exceed the benefits.

OBJECTIVES—To examine glycemic control levels among older adults with diabetes mellitus by health status and to estimate the prevalence of potential overtreatment of diabetes.

DESIGN, SETTING, AND PARTICIPANTS—Cross-sectional analysis of the data on 1288 older adults (≥ 65 years) with diabetes from the National Health and Nutrition Examination Survey (NHANES) from 2001 through 2010 who had a hemoglobin A_{1c} (HbA_{1c}) measurement. All analyses incorporated complex survey design to produce nationally representative estimates.

EXPOSURES—Health status categories: very complex/poor, based on difficulty with 2 or more activities of daily living or dialysis dependence; complex/intermediate, based on difficulty with 2 or more instrumental activities of daily living or presence of 3 or more chronic conditions; and relatively healthy if none of these were present.

MAIN OUTCOMES AND MEASURES—Tight glycemic control (HbA_{1c} level, <7%) and use of diabetes medications likely to result in hypoglycemia (insulin or sulfonylureas).

RESULTS—Of 1288 older adults with diabetes, 50.7% (95% CI, 46.6%–54.8%), representing 3.1 million (95% CI, 2.7–3.5), were relatively healthy, 28.1% (95% CI, 24.8%–31.5%), representing 1.7 million (95% CI, 1.4–2.0), had complex/intermediate health, and 21.2% (95% CI, 18.3%–24.4%), representing 1.3 million (95% CI, 1.1–1.5), had very complex/poor health. Overall, 61.5% (95% CI, 57.5%–65.3%), representing 3.8 million (95% CI, 3.4–4.2), had an HbA_{1c} level of less than 7%; this proportion did not differ across health status categories (62.8% [95% CI, 56.9%–68.3%]) were relatively healthy, 63.0% (95% CI, 57.0%–68.6%) had complex/intermediate health, and 56.4% (95% CI, 49.7%–62.9%) had very complex/poor health ($P = .26$). Of the older adults with an HbA_{1c} level of less than 7%, 54.9% (95% CI, 50.4%–59.3%) were treated with either insulin or sulfonylureas; this proportion was similar across health status categories. During the 10 study years, there were no significant changes in the proportion of older adults with an HbA_{1c} level of less than 7% ($P = .34$), the proportion with an HbA_{1c} level of less than 7% who had complex/intermediate or very complex/poor health ($P = .27$), or the proportion with an HbA_{1c}

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Potential Overtreatment of Diabetes Mellitus in Older Adults With Tight Glycemic Control

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level of less than 7% who were treated with insulin or sulfonylureas despite having complex/intermediate or very complex/poor health ($P = .65$).

CONCLUSIONS AND RELEVANCE—Although the harms of intensive treatment likely exceed the benefits for older patients with complex/intermediate or very complex/poor health status, most of these adults reached tight glycemic targets between 2001 and 2010. Most of them were treated with insulin or sulfonylureas, which may lead to severe hypoglycemia. Our findings suggest that a substantial proportion of older adults with diabetes were potentially overtreated.

Caring for older patients with diabetes is a major public health and policy challenge. The prevalence of diabetes is high, with 20% of adults older than 65 years having a known diagnosis of diabetes (estimated at 7.8 million persons in the United States).¹ Compared with their nondiabetic peers, older adults with diabetes have a higher risk of microvascular and cardiovascular diseases, geriatric conditions (eg, falls, dementia), and hypoglycemia. Diabetes is so prevalent that its management frequently serves as a core chronic condition in quality-of-care assessments.

Historically, clinical trials of diabetes care have excluded older patients, but recent trials of glucose control strategies have enrolled patients in their 60s and 70s.^{2,3} These trials have demonstrated that very intensive glucose control (pursuing glycated hemoglobin [A_{1c}] $<6.5\%$) in the short-term produced little or no reduction in end-stage microvascular and cardiovascular complications, increased the risk of hypoglycemia, and, in the case of 1 trial, increased the risk of mortality.² Follow-up studies have revealed that there may be long-term cardiovascular benefits for intensive glycemic control among patients with 10 years of observation.⁴

These findings are a reminder that diabetes has a long natural history and that glucose lowering may not produce benefits for years. Selecting the optimal goals and treatments for an individual patient requires an awareness of where the patient is in his or her life course. Compared with middle-aged patients, older patients living with diabetes are more likely to have had the disease for more than a decade and to be living with multiple comorbid illnesses and functional impairments. Evidence from decision analysis and observational studies suggests that comorbid illnesses and functional impairments increase the risks and lessen the benefits of pursuing intensive glycemic control with complex treatment regimens.⁵

Geriatric diabetes guidelines have long recognized the importance of comorbidity and functional impairment and have endorsed the concept of individualizing diabetes goals and treatments by health status. In 2012, guidelines from the American Diabetes Association (ADA) emphasized individualization of diabetes care based on life expectancy, self-care abilities, and patient preferences.⁶ The ADA provided a framework for stratifying patients by health status into classes labeled healthy, complex, or very complex, with distinct A_{1c} goals of less than 7.5%, less than 8.0%, and less than 8.5%, respectively.

Using this framework, in the March 2015 issue of *JAMA Internal Medicine*, Lipska et al⁷ described the diabetes treatment intensity among older patients classified by health status in the National Health and Nutrition Examination Survey (NHANES) (2001–2010). The

proportion of older patients achieving an A_{1c} level less than 7.0% was 61% overall and no different across the 3 tiers of health status. Among patients with A_{1c} less than 7.0%, 54.9% were treated with either insulin or sulfonylureas, and this proportion was similar across the 3 tiers of health status (60.0% in very complex). The study leaves no doubt that many older adults with complex health status are treated to reach very low glucose levels with medications. This may represent overtreatment on a vast scale.

The definition of overtreatment is open to debate and is the study's most important limitation. This debate is reflected in important differences in recent diabetes care guidelines. The ADA guidelines do not identify lower A_{1c} boundaries, allowing ongoing treatment even at very low A_{1c} levels. In contrast, the recent 2013 American Geriatrics Society (AGS) diabetes treatment guidelines identified lower boundaries of glucose control for different tiers of health status (eg, "healthy": 7.0%–7.5%).⁸ Thus, a healthy, 75-year-old patient taking glipizide with an A_{1c} level of 6.5% would be appropriately treated according to the ADA but would be considered overtreated according to the AGS.

Another important limitation of the report by Lipska et al⁷ is not knowing the treatment preferences of patients considered overtreated. Some complex patients might have preferred continuation of intensive treatments despite the treatments' modest benefits and greater risks. The drugs given to very complex patients may also reflect clinical constraints faced by physicians. Renal dysfunction is listed as a contraindication for metformin and may help explain the high rates of insulin use. The very complex patients, as defined by Lipska et al,⁷ may have had long-duration diabetes, which is associated with poor beta-cell function. When this occurs, physicians may also feel compelled to use insulin.

Despite these caveats, the analysis by Lipska et al⁷ provokes questions about how to provide care for the increasing population of older patients living with diabetes. Given the long-term nature of diabetes and its complications, the challenges are when and how to modify the intensity of goals of care and treatment. Younger patients with recently diagnosed diabetes and long life expectancies are most likely to benefit from intensive glucose control, yet many of these patients continue to be undertreated. However, efforts to address undertreatment for these patients may be inadvertently applied to the care of older patients with multiple chronic illnesses, resulting in their overtreatment.

To better address the treatment needs of older patients with diabetes, more research is needed to determine the risks and benefits of intensifying, maintaining, or deintensifying treatments for the oldest patients with multiple chronic illnesses. Because of the challenges of conducting trials including older patients with multiple illnesses, shortened life expectancy, or cognitive impairment, both observational studies and controlled trials are needed to answer basic questions. This research should extend into the development and study of decision support tools designed to help older patients and their physicians regularly reevaluate an individual's goals in diabetes care, taking into account comorbidities, functional status, and treatment preferences.

Reforms also are needed in the assessment of quality of diabetes care. Although diabetes performance measures have been designed with exclusions for patients older than 75 years,

these measures have encouraged a culture of intensification that has led some physicians to ignore the evolving health status of the individual patient. As Medicare strengthens the linkage between physician payment and quality of care, it is important to harmonize performance measures and practice guidelines for diabetes, to reduce the conflicts that physicians currently experience when caring for the oldest patients with multiple chronic illnesses.

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