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Diabetes Overtreatment in Elderly Individuals
Risky Business in Need of Better Management

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Assessing Potential Glycemic Overtreatment in Persons at Hypoglycemic Risk

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IMPORTANCE Although serious hypoglycemia is a common adverse drug event in ambulatory care, current performance measures do not assess potential over-treatment.

OBJECTIVE To identify high-risk patients who had evidence of intensive glycemic management and thus were at risk for serious hypoglycemia.

DESIGN, SETTING, AND PARTICIPANTS Cross-sectional study of patients in the Veterans Health Administration receiving insulin and/or sulfonylureas in 2009.

MAIN OUTCOMES AND MEASURES Intensive control was defined as the last hemoglobin A_{1c} (HbA_{1c}) measured in 2009 that was less than 6.0%, less than 6.5%, or less than 7.0%. The primary outcome measure was an HbA_{1c} less than 7.0% in patients who were aged 75 years or older who had a serum creatinine value greater than 2.0 mg/dL or had a diagnosis of cognitive impairment or dementia. We also assessed the rates in patients with other significant medical, neurologic, or mental comorbid illness. Variation in rates of possible glycemic overtreatment was evaluated among 139 Veterans Health Administration facilities grouped within 21 Veteran Integrated Service Networks.

RESULTS There were 652 378 patients who received insulin and/or a sulfonylurea with an HbA_{1c} test result. Fifty percent received sulfonylurea therapy without insulin; the remainder received insulin therapy. We identified 205 857 patients (31.5%) as the denominator for the primary outcome measure; 11.3% had a last HbA_{1c} value less than 6.0%, 28.6% less than 6.5%, and 50.0% less than 7.0%. Variation in rates by Veterans Integrated Service Network facility ranged 8.5% to 14.3%, 24.7% to 32.7%, and 46.2% to 53.4% for HbA_{1c} less than 6.0%, less than 6.5%, and less than 7.0%, respectively. The magnitude of variation by facility was larger, with overtreatment rates ranging from 6.1% to 23.0%, 20.4% to 45.9%, and 39.7% to 65.0% for HbA_{1c} less than 6.0%, less than 6.5%, and less than 7.0%, respectively. The maximum rate was nearly 4-fold compared with the minimum rates for HbA_{1c} less than 6.0%, followed by 2.25-fold for HbA_{1c} less than 6.5% and less than 2-fold for HbA_{1c} less than 7.0%. When comorbid conditions were included, 430 178 patients (65.9%) were identified as high risk. Rates of overtreatment were 10.1% for HbA_{1c} less than 6.0%, 25.2% for less than 6.5%, and 44.3% for less than 7.0%.

CONCLUSIONS AND RELEVANCE Patients with risk factors for serious hypoglycemia represent a large subset of individuals receiving hypoglycemic agents; approximately one-half had evidence of intensive treatment. A patient safety indicator derived from administrative data can identify high-risk patients for whom reevaluation of glycemic management may be appropriate, consistent with meaningful use criteria for electronic medical records.

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It seems intuitive that in a disease marked by hyperglycemia, normalization of glycemia should prevent the end-organ damage associated with it. Indeed, lowering blood glucose has been the focus of diabetes management for decades on the presumption that it would improve risk of renal failure, cardiovascular events, and death in patients with elevated levels of glycated hemoglobin, even though the proof for such effect has been elusive.[1] The United Kingdom Prospective Diabetes Study (UKPDS) appeared to validate the targeting of lower hemoglobin A_{1c} (HbA_{1c}) levels in type 2 diabetes, as this randomized trial showed lower rates of microvascular complications of diabetes such as retinopathy and renal failure in patients under intensive glycemic control compared with conventional therapy.[2] However, a growing body of evidence supports the idea that intensive glycemic control causes harm in certain subpopulations of diabetic patients who were underrepresented in trials like the UKPDS. Consider that patients in the UKPDS were newly diagnosed and relatively healthy, with a mean age of 53 years. Those older than 65 years were excluded. Contrast this with the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial, in which the upper age limit was 79 years and the mean age was 63 years. This trial was stopped early because of higher all-cause mortality in the intensive therapy group.[3] Clearly, for this patient demographic, intensive glycemic control is risky business. Indeed, what was previously considered good control for all is now considered overtreatment in elderly patients because it is associated with more harm than benefit.

Given the risks associated with intensive glycemic control in elderly individuals and in those with chronic medical conditions, it now behooves physicians and health systems to understand the extent of potential diabetic overtreatment in everyday practice and seek to improve it. In the February issue of *JAMA Internal Medicine*, Tseng and colleagues[4] further evaluated the scope of potential diabetic overtreatment within Veterans Health Administration (VHA) facilities, and the results are sobering. Using VHA databases, these investigators identified patients older than 75 years with diabetes being managed with either a sulfonylurea or insulin therapy who also had either a serum creatinine level greater than 2.0 mg/dL or a diagnosis of cognitive impairment or dementia. That is, the patients in this study were at high risk for hypoglycemic events and associated adverse outcomes and unlikely to achieve health benefits from intensive control. The investigators then identified the proportion of these high-risk individuals who had HbA_{1c} levels less than 7%, less than 6.5%, and less than 6%, representing categories of increasingly intensive glycemic control. They found that half of the patients (50.0%) identified as high risk for adverse outcomes had HbA_{1c} levels less than 7.5%. Furthermore, 28.6% of these high-risk patients had HbA_{1c} less than 7.0% and more than 1 in 10 (11.3%) had a normal or near-normal HbA_{1c} level, less than 6.0%. These results show a substantial proportion of individuals are being overtreated and placed at risk for serious harm with such treatment.

Why does this happen? In view of the findings from the ACCORD study, Veterans Affairs Diabetes Trial (VADT),[5] and Action in Diabetes and Vascular Disease (ADVANCE) trials,[6] all of which showed no benefit or harm associated with intensive glycemic control, how do well-meaning physicians seemingly ignore the evidence and either initiate therapy inappropriately or fail to step down therapy where indicated? A definitive answer requires further research, but several explanations are possible. First, reconciling the practice of evidence-based and patient-centered medicine is challenging and requires relentless mindfulness to assimilate the latest evidence and the changing health status of patients, to include preferences, cognitive function, life expectancy, and other competing illness demands. Second, clinical inertia appears to work both ways: not only are physicians slow to initiate treatment when indicated, as has been shown in studies of treatment initiation or intensification in hypertension,[7] but physicians also hesitate to pull back or scale down therapy.[8] Clinical inertia provides a framework for further study of the reasons why physicians fail to reduce therapy. Third, physicians and patients alike are inundated with conflicting and obfuscating information. On the one hand, multiple guidelines from reputable organizations often contain radically different messages. On the other hand, intense marketing efforts from the pharmaceutical industry and direct-to-consumer advertising make it difficult for physicians to counter-detail at the point of care. Fourth, discussing the de-escalation of any care can be challenging for patients and physicians alike. Patients or caregivers may be reluctant to contemplate or acknowledge their own decline in health and limited life expectancy. Conversations about forgoing treatment are difficult for a primary care physician to have within the space of a typical 15- or 20-minute appointment. It is much easier to just refill the prescription for glipizide. Nevertheless, physicians owe it to patients to discuss the de-escalation of care in a timely and sensitive manner when appropriate.

Tseng and colleagues have done a great service in revealing the extent of potential overtreatment in patients with diabetes in the VHA who are at high risk for adverse hypoglycemic events and stand to benefit little from intensive glycemic control. This risk of overtreatment must be in the forefront of the minds of all health care professionals who care for elderly patients with diabetes. Physicians are given the license to prescribe with the license to practice; it is important to know when the best practice is not to prescribe. Accordingly, health systems have the responsibility to monitor such overtreatment in their quality programs, just as they monitor optimal treatment, and enable the processes to minimize harmful practice.

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