Patient data can predict life expectancy for older adults with diabetes

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Dr. Kevin Griffith of the VA Boston Healthcare System was one of the leads on a study that identified dozens of risk factors that together accurately predict life expectancy for older patients with diabetes, as an aid to treatment planning and shared decision-making. Credit: Mackenzie Adams

A new study finds that clinicians can use patient data, such as a history of co-occurring health conditions and medication, to predict the 5- and 10-year life expectancy of older people with diabetes.

The ability to make such predictions, the researchers say, may help clinicians and patients develop personalized treatment goals that balance risks and benefits.

The results appear June 19 in the journal *Diabetes Care*.

Drs. Kevin Griffith and Paul Conlin of the VA Boston Healthcare System led the study.

The researchers embarked on the study knowing that federal and professional society clinical practice guidelines recommend that treatment goals be individualized for older adults with diabetes.

Key factors that impact diabetes treatment goals include co-occurring health conditions (such as severe mental illness or cancer); diabetes complications, such as chronic kidney disease and heart failure; co-existing conditions, and life expectancy.

The benefits of lower blood sugar can take several years to occur. For some older adults with limited life expectancy, the treatment burden may not be worth the benefits.

"But the guidelines don't give doctors guidance for how to decide whether or not people fall into these different bins for life expectancy," Griffith noted. "Furthermore, clinicians are notoriously inaccurate in predicting life expectancy, with studies frequently showing both over- and underestimating. We developed models with high predictive validity of future mortality in a large sample of older Veterans with diabetes."

Conlin added: "Our goal was to use the best available information to inform decision-making in setting glucose control targets. Doctors and patients, of course, can then use their own judgment to make a decision."

The researchers reviewed the electronic health record data of more than 275,000 Veterans with diabetes who were at least 65 years old.

Using predictive modeling techniques, they identified 37 predictive factors that have previously been linked to, or are suspected to impact, mortality in older adults with diabetes: demographic variables (age, sex, marital status); prescriptions for insulin or sulfonylureas, a class of diabetes drugs; and biomarkers such as hemoglobin A1c, blood pressure, body mass index, and levels of cholesterol and triglycerides, a type of fat found in the blood.

The 37 predictive factors also included inpatient and outpatient history and more than 20 medical procedures and co-occurring health disorders.

The results placed patients in three time frames for expected death: within five years, 5 to 10 years, and more than 10 years.

The final predictive models for 5- and 10-year mortality had high predictive validity and demonstrate the importance of several individual and condition-specific characteristics that may inform clinicians and patients about life expectancy.

"We aren't saying, for example, that any of these risk factors result in decreased life expectancy," Griffith commented. "However, the more risk factors that individuals have, the greater the risk of higher mortality over time."

The researchers suggested that these results could assist clinicians in using shared decision-making to establish A1c target ranges that balance

treatment benefits and risks.

The study has some important limitations. Since the analysis was based on a Veteran cohort and on older adults, it is possible that results may not generalize to other settings. However, the predictive models can be evaluated by other health care systems that have similar electronic health care records.

It is also possible that recent changes in the approach to older adults with diabetes, such as less emphasis on tight blood sugar control, as well as treatment advances especially for congestive heart failure and chronic kidney disease, could affect model results.

Conlin said he hopes that in the future, predictive models will come into use at the point of care to help clinicians and patients mutually set diabetes treatment goals. However, he noted that the study findings are immediately relevant to clinicians.

"Our results identify multiple common conditions that can easily be identified in clinical practice and assist clinicians in shared decision-making with patients, which is a key recommendation of the VA/DoD Diabetes Guidelines," said Conlin.

On a related note, VA recently launched an Understand Your Diabetes Numbers campaign to assist patients with treatment decisions.

  More information: Paul R. Conlin et al. Synopsis of the 2017 U.S. Department of Veterans Affairs/U.S. Department of Defense Clinical Practice Guideline: Management of Type 2 Diabetes Mellitus, *Annals of Internal Medicine* (2017). DOI: 10.7326/M17-1362

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