Newer diabetes drugs cost more, but may not work better

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Two newer classes of drugs to treat adult-onset diabetes may be no more effective than the old standby, yet they cost significantly more over the course of a patient's disease.

That's according to a National Science Foundation-funded study by researchers at the University of Michigan, Mayo Clinic and North

Carolina State University.

Based on a simulation model that involved 15 years worth of actual patient data from more than 37,000 individuals, the researchers found that the newer drugs cost patients and insurance companies anywhere from $1,600 to $2,400 more.

That's from the time a person is diagnosed until he or she develops heart problems, circulatory complications or dies. The exact time period varies widely, but it can be more than a decade.

Some 25 million Americans live with type 2 diabetes today, so the researchers say the findings offer an avenue for substantial savings.

"Conventional wisdom would suggest the newer medications should be more effective since they cost more, but what we find is that they don't appear to result in people living longer or avoiding complications," said principal investigator Brian Denton, U-M associate professor of industrial and operations engineering who specializes in medical decision-making.

The drugs they studied are the second line of defense when the body develops resistance to the gold standard medication known as metformin. At that point, doctors typically prescribe an additional pill to stave off daily insulin shots. While there are many different options, there's no consensus as to which work best.

The simulation model, developed by lead study author Yuanhui Zhang, a doctoral student at North Carolina State, compared the newer classes known as DPP-IV inhibitors and GLP-1 agonists with the older drug called sulfonylurea. They all have different mechanisms for stabilizing patients' blood sugar levels (DPP-IV inhibitors are marketed under the names names Januvia, Onglyza and Tradjenta; popular GLP-1 agonists

include Byetta and Victoza).

In the years since the more modern drugs have been released, many doctors have shifted to prescribing them over the older sulfonylurea—partially because they don't have the risk of hypoglycemia and weight-gain side effects that sulfonylurea can have. But the shift is partially to blame for a rise in the cost of diabetes medications and management, the study shows.

"All of the medications that have been considered in the model have some risk and down sides that can impact a person's well-being," said Steven Smith, an endocrinologist at Mayo Clinic. "But our model can help to assess optimal decision-making that would take into account individual and unique risks for all medications, old and new."

Down the road, the researchers envision a tool that doctors themselves can use.

Simulations can provide a unique perspective that could in some ways model the real world better than a clinical trial, Denton said. Patients participating in a clinical trial may behave differently than they would otherwise, adhering to doctors' orders better.

More information: Yuanhui Zhang, Rozalina G. McCoy, Jennifer E. Mason, Steven A. Smith, Nilay D. Shah, and Brian T. Denton. "Second-line Agents for Glycemic Control for Type 2 Diabetes: Are Newer Agents Better?" *Diabetes Care* published ahead of print February 26, 2014, DOI: 10.2337/dc13-1901 1935-5548

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