Curing Hepatitis C Improves Blood Sugar in Those With Type 2 Diabetes

Those who beat hep C also reduced their insulin use.

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People with type 2 diabetes and hepatitis C virus (HCV) who cure the virus improve their blood sugar levels and also reduce their insulin use on average. Given hep C's strong relationship with diabetes, this finding brings hope for a considerable benefit from curing the virus.

Previous studies of interferon-based hep C regimens have suggested that curing HCV could lead to improvements in insulin resistance. However, no large studies have examined glycemic control (blood sugar levels) in those with diabetes following a hep C cure.

In the United States, an estimated 9.8 percent of the population (29.1 million people) has diabetes, and 1.4 percent of the population (3.5 million people) has hep C. Type 2 diabetes is nearly four times more likely to develop in those with HCV than in those without the virus.

Veterans Affairs researchers in Seattle and in Portland, Oregon, therefore designed a study to compare glycemic control among individuals with diabetes based on whether a hep C cure attempt succeeded or failed. The investigators based their assessment of glycemic control on changes in hemoglobin A1C (HbA1C) levels and the use of diabetes mediations before and after treatment with direct-acting antivirals (DAAs) for HCV.

Publishing their findings in Diabetes Care, the researchers analyzed data from the VA Corporate Data Warehouse, a national electronic database that includes data from all 167 medical centers and 875 ambulatory care and community-based outpatient clinics in the VA system.

Between January 2014 and June 2015, VA patients began 24,089 DAA regimens, completing them by October 1, 2015. The study authors excluded regimens that contained interferon or ribavirin, individuals who were not diagnosed with type 2 diabetes before starting HCV treatment and those who had previously been treated for the virus. They also excluded those without proper data to determine whether they were cured of HCV and without data about their HbA1c levels. This left a cohort of 2,435 people, including 2,180 who were cured of HCV and 255 who were not.

The average age of the cohort members was 62.2 years, and the average body-mass index (BMI) was 30.2. A total of 97.5 percent were male. A total of 99.3 percent had HCV genotype 1 and 0.7

percent had genotype 4. A total of 56.2 percent were treated with Harvoni (ledipasvir/sofosbuvir), 38.3 percent received Olysio (simeprevir) plus Sovaldi (sofosbuvir) and 5.5 percent received the Viekira regimen (ombitasvir/paritaprevir/ritonavir; dasabuvir). A total of 37.3 percent had cirrhosis, including 10.4 percent who had decompensated cirrhosis, the more advanced form of the severe liver disease. A total of 41.4 percent had alcohol use disorder. A total of 75.2 percent took at least one diabetes medication, and 42.2 percent took insulin. The average HbA1c level was 7.2 percent.

An individual with an HbA1c of 6.5 percent or greater is considered to have type 2 diabetes. For the purpose of this study, the researchers otherwise defined someone as having type 2 diabetes if he or she was taking a diabetes medication during the 12 months prior to taking DAAs.

Those who were cured of HCV through DAA treatment compared with those whose treatment failed were less likely to have cirrhosis (35.3 percent vs. 54.5 percent) and decompensated cirrhosis (9.3 percent vs. 20 percent) and be taking diabetes medications (74.8 percent vs. 78 percent) or insulin (41.3 percent vs. 49.8 percent). Those whose DAA treatment failed had markers of more severe liver disease.

Before receiving hep C treatment, HbA1c levels were a respective 7.2 percent and 7.27 percent in those who were and were not cured. Those who were cured experienced an average drop in HbA1c of 0.37 percentage points compared with 0.19 percentage points among those who were not cured, for a difference of 0.18 percentage points.

After adjusting the data for potential confounders, including age, sex, race and ethnicity, cirrhosis status, platelet count, hemoglobin level, creatinine, bilirubin, albumin, international normalized ratio (INR, a measure of blood-clotting capacity), BMI and FIB-4 score (a measure of liver disease severity), the researchers found that the adjusted average difference in the drop in HbA1c was 0.13 percentage points.

A significant drop in HbA1c level associated with curing hep C occurred only among those who started with a high HbA1c level, specifically one greater than 7.2 percent. In this group, the adjusted average difference in the decline in HbA1c between those cured and not cured of HCV was 0.34 percentage points.

The respective average number of classes of diabetes medications taken upon starting DAAs by those who were and were not cured was a respective 1.15 and 1.16. There was no significant change in the number of diabetes medication classes taken following DAA treatment based on hep C cure status.

The proportion of individuals receiving insulin decreased among those cured of hep C (from 41.3 percent to 38 percent), while this proportion increased slightly among those who were not cured of the virus (from 49.8 percent to 51 percent). The adjusted average difference in this shift between those cured and not cured was 4.2 percentage points.

The decline in insulin use among people cured of hep C was more pronounced among those who had a low HbA1c level (7.2 percent or below) prior to DAA treatment. The reduction in insulin use

did not occur as use of the diabetes drug Glucophage (metformin) rose, indicating that the shift was not driven by the replacement of insulin with Glucophage. On the contrary, use of Glucophage also declined: by 2.2 percentage points among those cured of HCV and by 1.9 percentage points among those not cured.

“In summary,” the study authors concluded, “glycemic control improves in patients with diabetes after DAA-induced [cure of HCV]. Patients not only have an improvement in HbA1c level after [being cured of HCV], they are also less likely to require insulin. These endocrine benefits of SVR provide additional justification for considering antiviral treatment in all patients with diabetes. Future studies are need to confirm our findings, to determine how durable the SVR-induced improvement in glycemic control is over time, and to assess the long-term effect on complications of diabetes.”

To read the study abstract, click here.
