Could a Healthy Lifestyle Prevent Most Liver Cancer?

Smoking cessation, moderate drinking, a healthy diet, exercise and weight loss could dramatically reduce the growing burden of liver cancer.

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People who maintain a healthy lifestyle can dramatically reduce their risk of developing hepatocellular carcinoma (HCC, the most common type of liver cancer) and dying from liver-related causes, according to research presented this month in Boston at The Liver Meeting, the annual meeting of the American Association for the Study of Liver Diseases.

“Our findings strongly support continued efforts to develop public health policies for lifestyle modification to prevent HCC and liver-related mortality,” lead researcher Tracey Simon, MD, of Massachusetts General Hospital, said in a conference press release. “Our data suggested that adherence to a healthy overall lifestyle could potentially prevent more than 30,000 liver-related deaths in the United States each year.”

Over years or decades, chronic hepatitis B or C, heavy alcohol consumption, fatty liver disease and other causes of liver injury can lead to liver cirrhosis (severe scarring), liver cancer and the need for a liver transplant. HCC is among the fastest-growing causes of cancer-related death in the United States and worldwide.

Along with hepatitis B virus (HBV) vaccination and hepatitis C treatment, studies show that individual lifestyle changes such as smoking cessation, drinking little or no alcohol and weight loss can reduce the risk of liver cancer and its complications. Simon’s team set out to determine the overall impact of lifestyle on HCC incidence (new cases) and liver-related mortality.

The study looked at data from two prospective cohorts of U.S. adults. The Nurses’ Health Study (NHS) enrolled more than 121,000 women ages 30 to 55 in 1976. The Health Professionals Follow-up Study (HPFS) enrolled over 51,000 men ages 40-75 in 1986. Members of both cohorts provided detailed clinical, lifestyle and dietary information every two to four years.

This analysis included 76,713 women in the NHS and 48,748 men in the HPFS who had complete lifestyle data available in 1986; they were followed through 2012. People who already had viral hepatitis, cirrhosis or liver cancer at study entry were excluded.

The researchers focused on five healthy lifestyle factors:

- Body mass index: normal weight, or a body mass index (BMI) of 24.9 or lower
- Physical activity: at least 150 minutes of moderate to vigorous exercise per week
- Smoking: current non-smoker, either a never-smoker or someone who had quit
- Diet: a score in the upper 40% on the Alternate Healthy Eating Index 2010, which assesses diet quality.
- Alcohol: one or fewer drinks per day for women or two or fewer drinks for men.

The researchers calculated population attributable risk, or the proportion of liver cancer cases and liver-related deaths that could have been prevented if all participants adhered to a healthy lifestyle. To assess whether their findings were generalizable to the population as a whole—which may not be as healthy as health professionals—they then did a similar analysis based on a nationally representative sample of adults from the 2009-2010 National Health and Nutrition Examination Survey (NHANES).

In the pooled NHS and HPFS cohort, about two thirds were women, more than 90% were white and the average age was about 52. These demographics were similar regardless of the number of healthy lifestyle factors. As expected, people with more healthy lifestyle factors were less likely to have diabetes, high blood pressure or abnormal blood fat levels.

Considered individually, each lifestyle factor independently predicted a higher risk of developing liver cancer. For smoking, a jump in HCC cases occurred among those who smoked 15 or more cigarettes a day (less than a pack). For alcohol use, the risk rose even for those who consumed just 5 to 15 grams per day (14 grams is considered a standard drink, for example one bottle of beer, glass of wine or shot of distilled spirits). Liver cancer cases decreased steadily as diet quality and amount of exercise increased.

Not smoking was associated with a 27% reduction in HCC incidence, a healthy diet reduced the risk by 17%, light or no drinking reduced the risk by 21%, a healthy weight lowered incidence by 36% and a healthy level of exercise reduced the risk by 35%. Looking at population attributable risk, these factors could have prevented 8%, 10%, 14%, 25% and 22% of HCC cases, respectively.

Turning to liver-related mortality, meeting the definition of healthy for each of the five lifestyle factors reduced liver-related deaths by 31%, 19%, 37%, 48% and 54%, respectively. These factors could have prevented 16%, 8%, 20%, 37% and 35% of deaths.

For both liver cancer and liver-related death, BMI and exercise were the two most important factors, Simon noted. In the NHS and HPFS cohorts, maintaining a healthy BMI or exercising regularly could have prevented 22% to 25% of new liver cancer cases and 35% to 37% of liver-related deaths.

Compared to individuals with no healthy lifestyle factors, liver cancer risk decreased by 27% among those with one factor, by 58% among those with two factors, by 81% among those with three factors and by 92% among those with four or more factors. HCC incidence rates were 8, 7, 4, 3 and 2 cases per 100,000 cumulative years of follow-up, respectively, for those with zero, one, two, three or four or more healthy lifestyle factors.

The findings were similar for liver-related death. Compared to those with no healthy lifestyle factors, mortality decreased by 33% among those with one factor, by 66% among those with two factors, by 74% among those with three factors and by 97% among those with four or more factors. Mortality rates were 42, 21, 15, 7 and 4 deaths per 100,000 years of follow-up, respectively.

For both HCC cases and liver-related deaths, these patterns remained similar after adjusting for cases of viral hepatitis or cirrhosis that occurred during follow-up, Simon reported.

An exploratory analysis of 1,401 participants who already had cirrhosis at baseline showed that they, too, could still benefit from adopting a healthy lifestyle. Those with one healthy factor had a 17% lower risk of liver-related death, those with two factors had a 33% lower risk and those with three or more factors had a 47% relative risk reduction.

Considering the lifestyle factors in combination, having four or more healthy factors predicted an 88% lower risk of developing liver cancer and a 91% reduction in liver-related death. This combination could have prevented 82% of HCC cases and 90% of deaths.

Having three healthy factors was associated with a 46% lower risk of HCC and a 63% lower risk of liver-related death. That is, the triple combination could have prevented 74% of HCC cases and 80% of deaths. Even having just two healthy factors lowered the risk of HCC by 30% and mortality by 40%, preventing 45% of liver cancer cases and 58% of liver-related deaths.

Looking at the NHANES cohort, the researchers found that lifestyle had an even bigger impact. In this general population cohort, having four or more healthy lifestyle factors could have prevented 89% of liver cancer cases and 94% of liver-related deaths.

“These findings underscore the enormous potential of primary prevention to reduce the growing burden of HCC and liver-related mortality,” the study authors concluded.

“Right now, there are not yet any effective medications to reverse liver fibrosis or prevent HCC. It is essential that we focus on controlling risk factors through primary prevention,” Simon said. “Lifestyle modification represents a primary prevention effort that is likely to be a more effective and feasible way to prevent HCC and liver-related mortality at the population level.”

Click here to read the study abstract.

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