Research finds targeted screening for hepatitis C is cost-effective

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Researchers at the University of Cincinnati have found that targeted screening for populations with a higher estimated prevalence for hepatitis C may be cost-effective.

These findings, published in the April 24, 2013, online edition of the journal *Clinical Infectious Diseases*, indicate that targeted screening for chronic hepatitis C virus infection is cost-effective when the prevalence of hepatitis C in a population exceeds 0.84 percent (84/10,000).

The study further demonstrates how a screening tool, which can be incorporated into an electronic health record, can target such patients and help in preventing the spread of the illness.

Mark Eckman, MD, Alice Margaret Posey Professor of Internal Medicine, professor in the division of general internal medicine and UC Health physician, and Kenneth Sherman, MD, PhD, Robert & Helen Gould Endowed Chair, professor in the division of digestive diseases and UC Health physician, co-authored the study.

"Hepatitis C is the most common chronic blood-borne infection in the United States and will become an increasing source of morbidity and mortality with aging of the infected population," says Sherman, adding that hepatitis C is a viral disease that leads to inflammation of the liver and can be spread through exchange of bodily fluids with an infected person.

"Our objective in this study was to develop decision analytic models, exploring the cost-effectiveness of screening in populations with varying prevalence of hepatitis C and risks for liver fibrosis—or scarring—in those with the illness who do not receive treatment. Liver fibrosis results in a damaged liver, and the patient eventually needs a transplant, increasing cost of care."

Researchers developed a computerized Markov state transition model—a mathematical framework for modeling decision-making in situations where outcomes are partly due to chance and partly under the control of a decision maker—to examine screening in a U.S. community whose residents showed no symptoms.

"The base case was an ethnically and gender-mixed adult population with no prior knowledge of diagnosis: 49 percent male, 78 percent white, 13 percent black and 9 percent Hispanic, with a mean age of 46 years," says Eckman.

The model explored strategies of screening followed by guideline-based treatment, if needed, and not screening. Effectiveness was measured in quality-adjusted life years (QALYs)—accounting for both duration of survival and quality of life—and costs were measured in U.S. dollars.

"In the base case, screening followed by guideline-based treatment—using boceprevir as the standard antiviral treatment—of those with chronic hepatitis C infection cost roughly $47,000 per QALY—a 'cost-effective' result," says Eckman. "The overall hepatitis C prevalence in the U.S. is reported to be between 1.3 and 1.9 percent, but prevalence varies among patients with different risk factors."

He continues that the marginal cost-effectiveness ratio (mCER) of screening decreases as prevalence increases.

"Below a prevalence of 0.84 percent within a population, the mCER is greater than the generally accepted societal willingness-to-pay threshold of $50,000 per QALY," he says. "Therefore, it is not considered highly cost-effective. However, by targeting screening in populations with a higher estimated prevalence, screening and subsequent treatment of those infected would be cost effective."

"Recently released guidelines by the Centers for Disease Control and Prevention advocate 'birth-cohort' focused screening for those born between 1945 and 1965. However, such a strategy may miss screening higher risk patients born in years outside of this cohort," Eckman adds. "Alternatively, patients with no risk factors for hepatitis C infection, other than their membership in the 'birth cohort,' may be at a low enough risk to make their screening less cost-effective."

Eckman and Sherman "argue for the development and proliferation of tools to assist in the implementation of guidelines. The increasing use of electronic health records and computerized order entry create new opportunities to marry guidelines to practice."

"Perhaps in this manner, targeted and cost-effective screening can become a reality," says Eckman.

Provided by University of Cincinnati Academic Health Center