

New non-invasive test may detect liver disease earlier

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Researchers from the National Institute for Health Research (NIHR) Biomedical Research Unit in Gastrointestinal and Liver Diseases at Nottingham University Hospitals NHS Trust and the University of Nottingham will be showing how new tests can detect liver disease at an earlier stage at this year's Royal Society Summer Science Exhibition which opens to the public officially today.

The number of deaths from liver disease increased by 25% between 2001- 2009 and the majority of deaths occurred in patients under the age of 70. In contrast, the rate of deaths from heart disease, cancer and stroke is declining. The common causes of liver disease are alcohol, obesity, diabetes and viruses. Often there are no symptoms until there is severe scarring (fibrosis) to the liver.

The team from Nottingham are using Magnetic Resonance Imaging (MRI) to quantify scarring within the liver. Water molecules in the body contain protons that display [magnetic properties](#). Increased scarring of the liver changes how [protons](#) behave in a magnetic field. Novel MRI methods have been developed that can be used to examine the whole liver and detect changes in scarring (fibrosis), inflammation, fat and iron; as well as changes to blood flow in advanced disease.

The researchers are also working to improve the way we use existing tests. Transient elastography, a technique first used as way to assess the texture of cheese, is now used in selected centres to measure liver stiffness. Scarred liver is stiffer than healthy liver. The method sends a

wave through the liver and measures how quickly that wave travels. This is related to the stiffness and hence the degree of scarring. Liver stiffness measurement (LSM) based on transient elastography (TE) correlates well with the stages of [liver fibrosis](#) and has been developed as a non-invasive alternative to [liver biopsy](#).

The team from Nottingham are using this technique in a community population with risk factors for liver disease and diagnosing previously undetected liver scarring. Finally, in selected cases where a piece of liver tissue (liver biopsy) is required for diagnosis; the team are developing image analysis techniques to improve the information the biopsy provides.

Dr Neil Guha, lead exhibitor from the University of Nottingham, says:

"The great advantage of the tests we are developing is firstly they are not as invasive as say, putting a needle into the liver and they have the ability be repeated on regular intervals allowing us to access patients in a much more personalised way. With regular tests we'll be able to tell patients whether their disease is getting worse or better.

"They are also a useful tool for those who are developing the drugs for [liver disease](#) to see whether their treatments are beneficial or not."

The scientists will be on hand to answer questions at the exhibition which runs from 2 July to 7 July.

More information: sse.royalsociety.org/2013/

Provided by The Royal Society

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