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Spread of hepatitis C pinpointed

Scientists say they have, for the first time, worked out the pattern of spread of hepatitis C, showing early diagnosis is key to preventing epidemics.

A study in injecting drug users in Greece indicated that each infected person spread the disease to 20 others - 10 of these in the first two years.

The researchers said their results would help tackle the disease's spread.

Globally up to 180 million people live with the virus, most are unaware that they have it.

Those infected do not develop symptoms for up to 20 years and spread it to others without realising.

Study leader Dr Gkikas Magiorkinis, from Oxford University, said when people were infected with something such as flu it was very easy to work out where it had come from, because people knew they were infected within days.

But with hepatitis C, no-one has been able to pin down how the virus spreads, because cases occur months or years apart.

Genetic signature

To overcome this problem, the researchers looked at four hepatitis C epidemics in Greece, using data from 943 patients collected between 1995 and 2000.

But to provide more detail on how it spreads, they also included genetic information on the virus taken from 100 samples.

Plugging the details into a computer model, they calculated that injecting drug users were "super-spreaders", each transmitting the virus to 20 other people.

Most importantly they discovered that most of the transmissions occurred in the first couple of years, they report in PLoS Computational Biology.

The researchers said that people were more infectious at in the early days of catching hepatitis C because they had higher levels of virus.

The evidence they have produced suggests programmes targeting the diagnosis and treatment of hepatitis C in high-risk groups as early as possible would prevent many new infections and associated health care costs many years down the line.

About 20% of those infected will develop cancer or liver scarring after 20 years of infection, at which point the only treatment is liver transplantation, which costs about £100,000 (\$160,000).

Dr Magiorkinis, who did the work in collaboration with the University of Athens and Imperial College London, said the model had helped build a "solid argument" to improve early diagnosis and antiviral treatment in drug users.

"Working out how many people are likely to be infected by each super-spreader of Hepatitis C, as well as how soon they will be infected, has been a puzzle for over 20 years," he said.

"Our research has resolved this issue and paves the way for a modelling study to show what kind of public health interventions could really make a difference."

He added the approach could be useful in other infections such as HIV.

Charles Gore, chief executive of The Hepatitis C Trust and president of the World Hepatitis Alliance, said: "This study is potentially very important.

"If we are better able to identify where the majority of transmission is happening in many Western countries, we will be able to improve and more cost effectively target interventions.

"It needs to be said, however, that globally hepatitis C is not 'a drug users' disease.

"Of the 150 million people living with the virus, only about 10 million are people who inject drugs, according to The Lancet. The vast majority of infections are the result of unsafe healthcare and we equally need to target prevention there."

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