Swiss HIV Cohort Study identifies simple method to determine time of infection

Researchers of the Swiss HIV Cohort Study have identified a simple method to establish when patient contracted the virus causing HIV. The time of infection can be of importance for the treatment of the illness and it contributes to the understanding of the course of the epidemic.

Medical doctors rarely know when a patient contracted HIV. The exact point in time can only be establishe in the first eight weeks after infection - during the so called acute phase. If the HIV test is taken later, it remains unclear if the infection took place three months or ten years ago. However, this is about to change as researchers supported by the Swiss National Science Foundation (SNSF) have discovered a simple method to determine the approximate time of infection.

Relevant to understanding the spread of the illness

According to Huldrych Günthard from the university hospital in Zurich, information regarding the time of infection is beneficial in many ways. It allows doctors to establish how quick the illness is progressing and determine the start of treatment accordingly. It will also inform epidemiological studies interested in how th disease is spreading.

In collaboration with colleagues from the ETH Zurich, researchers of the Swiss HIV Cohort Study analysed data that is obtained in routine resistance tests. These tests examine the genetics of the virus to establish resistance to drugs. If a patient carries a variety of HIV strains, the test reveals ambiguous results with regard to certain points in the sequences of the virus' genetic code.

By-product of resistance testing

"For a long time, the ambiguous results of the viral sequencing were considered a by-product of the test," says Günthard. "We wondered if they were an indicator of the variety of viruses in the blood." Viral variety i a result of reproduction and evolution in the body, it increases with time and the ambiguity could therefore an indicator for the time that has passed since infection. Günthard and his team tested this assumption by comparing the drug resistance data with an existing rudimentary method to calculate the time of infection. Additionally there are patients who know the exact time of HIV infection: e.g. patients who took the test during the acute phase or patients who took tests before and after the infection.

The study, that has now been published in the journal *Clinical Infectious Diseases*, was able to show that the proportion of ambiguous sequences is indeed increasing regularly during the first eight years after infection, afterwards the increase slows down. At the moment the new method is still too imprecise to establish the exact time of infection but the researchers were able to define a threshold level that indicates with 99% certainty if an infection happened more than a year ago.

Source: Swiss National Science Foundation