Ensuring the Quality of HIV Drug Resistance Testing in Asia

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TREAT Asia Quality Assessment Scheme (TAQAS) to standardize the outcome of HIV genotypic resistance testing in a group of Asian laboratories

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What is the problem that led the researchers to conduct this study?
There has been an expansion in the use of HIV drugs to treat people infected with the AIDS virus in Asia. These drugs work by stopping the virus from replicating (or making copies of itself), but sometimes the virus changes or mutates to become resistant to the action of the drugs. Different patterns of mutations result in the virus being resistant to some combinations of drugs, but other drug combinations may be able to prevent the virus from replicating. The development of drug resistant virus in an infected person means their current drug treatment may need to be changed so that treatment continues to be effective. Furthermore, people that become infected with a drug resistant virus will have to be treated with a combination of drugs that prevents their virus from replicating. Therefore, when treating with HIV drugs, it is important to test for the development of drug resistant HIV to make sure the drug treatment remains effective.

Why did the researchers conduct this particular study?
Whether HIV is becoming resistant can be detected by a laboratory blood test. HIV drug resistance testing detects the changes or mutations in the virus’s genetic material that cause drug resistance. From the pattern of mutations, the laboratory can work out the combination of HIV drugs that will stop the virus from reproducing in the patient. The test is difficult and complicated to perform, and different laboratories use different methods to do the test. All these factors can lead to suboptimal test results. Quality assurance programmes can be used to identify and help improve suboptimal laboratory results. These programmes try to ensure that the same result would be obtained by all laboratories if the same sample were tested; in other words, to standardize the results. TAQAS is a quality assurance laboratory network working with laboratories in Asia and Africa to improve the reliability and standardization of HIV resistance testing.
Who and what were included in the study?

Eleven laboratories that test for HIV resistance in eight Asian countries took part in the first phase of TAQAS, with an additional reference laboratory in the U.S. Sets of samples were sent to the laboratories for testing. The samples were from people who were infected with HIV-1, who were taking HIV drugs, and who had developed drug resistant virus.

How was the study done?

Over 18 months three different sets of samples were sent to the laboratories. The laboratories performed HIV resistance testing and sent their results to the TAQAS central coordinating site for confidential analysis. The laboratories were shown how their results compared with the results from the other laboratories. When a laboratory reported different results from all the other laboratories, that laboratory was asked to go back and work out why their results were different, and how they might improve their testing method. In addition to testing the samples, participating sites met to discuss testing problems and identify ways HIV resistance testing could be improved.

What did the researchers find?

All the Asian laboratories that took part in TAQAS produced high quality results from their HIV resistance testing. Eight laboratories detected at least 80% of the mutations in the viruses that caused drug resistance in all the sets of samples tested. Eight laboratories matched the performance of the reference laboratory in at least one set of samples by detecting more than 90% of the mutations. The two laboratories with suboptimal test results worked on improving their test process and their results improved in the next set of samples they tested.

What do these research findings mean? How could they impact HIV prevention and/or care and treatment of people living with HIV in Asia?

By taking part in TAQAS, these laboratories can be more confident that their HIV resistance test process and results are of high quality. Over the course of testing three sets of TAQAS samples, the laboratories improved or maintained a high standard of quality in HIV resistance testing. Being able to rely on these laboratories to produce consistently accurate results is necessary for surveillance and monitoring of HIV drug resistance in individual patients and across the region.

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