



BioSpect

the business of Bio

24 years of leveraging the business of Bio
www.biospectrumindia.com

SARS detection kits not easy to make

19 May 2003 | News



A diagnostic kit is a key tool that helps doctors to quickly identify patients infected with a viral infection. But with the SARS epidemic, doctors so far do not have that luxury. Because the current attack is the first known attack of the SARS virus on humans and so no one has bothered to develop a kit to diagnose it quickly.

So doctors are having a tough time to identify the patients with SARS infection those with the more common pneumonia disease or people with respiratory problems.

Doctors now rely on chest X-rays and a list of symptoms: fever, dry cough, malaise and lots of luck to pick out the SARS cases. "We need a test now," insists Dr Klaus StÃ¶hr, who directs the scientific investigation of SARS for the World Health Organization. "We had hoped to have one by now, but it is going to take longer than we thought."

There are two ways to make a diagnostic kit. There can be an appropriate kit than detect the virus itself. The other option is to detect the presence of antibodies, which are essentially proteins produced by the immune system to counter the virus.

The CDC has developed two preliminary kits which substantially in the detection of the SARS virus. A standard test, called polymerase chain reaction (PCR) has been used to successfully identify the SARS virus in patients. It is not a full proof yet it has been successful because it has not given any false reports. However, it couldn't identify the virus in some specimens.

By using the well known ELISA test which uses antibodies as the measuring mechanism, researchers have been able to detect the SARS virus. This test is more effective around 20 days of infection and unless it is extended to work in the early stages of the infection, it may not be very useful. There are several other problems in developing a diagnostic kit quickly. Its increasing presence in various humans has added to the problem. The antibody's presence was different in different human bodies. While it was believed to be present mostly in the mouth or saliva, now it is found in the blood too. And after the fifth day, the virus moves to the respiratory track which reduces the possibility of detection.

How is the world treating SARS patients?

Scientists now have some clues about the virus which is the cause of the SARS outbreak. Armed with this knowledge, teams of scientists across the world are working at break neck speed to develop potential drugs and treatments against the infection.

And most experts feel that it will be at least a year before a definite candidate drug could be identified. Meanwhile, health authorities worldwide are trying out various permutations and combinations of existing drugs and some drugs under different stages of development to identify the best ones that work even partially in controlling the infection. Health authorities are screening nearly 2,000 approved and experimental drugs, including some cleared for use against other viral diseases to find medicines that will inhibit the growth of the virus in laboratory cultures and eventually in humans.

According to a report in the latest issue of the well known medical journal, The Lancet, doctors in Hong Kong have been using a combination of steroids and the antiviral drug ribavirin which has been of some help. However, the US Army's Biodefense lab found in its tests that ribavirin did not inhibit the replication of the SARS virus grown in the laboratory. And a spate of new deaths in recent days in Hong Kong has dimmed enthusiasm for the treatment even there.

Another candidate under examination for use is Alpha interferon, a drug used to treat hepatitis C. Nasal sprays of alpha interferon was tried in the mid-1980s in the US among volunteers to test their effectiveness against a corona virus that causes common cold. It was done by Dr Ronald Turner, then of the University of Utah and now at the University of Virginia. SARS virus too belongs to the coronavirus family. But the interferon caused nasal irritation severe enough to make it unacceptable as a treatment for colds. Now scientists have to take a call whether the irritating side effects should be ignored in treating a more serious infection and test its efficacy.

Cystatin C, a protease inhibitor found in human blood has been found to be effective in blocking the replication of the coronaviruses that cause colds, in laboratory tests done by Dr Arlene Collins, associate professor of microbiology at the State University of New York at Buffalo. But it is unclear if it would inhibit the SARS virus, she said. Also Cystatin C has so far not been tested seriously for its use as a drug.

Another treatment under consideration is the use of immune therapy where antibodies to the SARS virus extracted from people who have recovered from SARS infection. It has to be tested whether such antibodies will resist the attacks by the virus.

The SARS virus, like other viruses, uses certain enzymes to replicate itself and spread. Now scientists will look for drugs that block such enzymes. This approach has been successful in treating diseases like AIDS. A technology developed by Oregon-based AVI BioPharma enables scientists to turn off particular genes. This technology has been successful in treating viral infection in several animals. Scientists may try this technology because of the availability of the sequence of the SARS Virus gene.

The use of killed SARS viruses in vaccines to treat SARS infection is another option. Such killed viruses, tried in the treatment of polio virus attacks, are now known to prepare the human body's immune system to fight the viral infection. Scientists at the National Institute of Allergy and Infectious

Diseases, US, are trying this method. Coronavirus, called so due to their crown-like shape, have so far kept away from humans. This is the first known case of infection among humans and hence the virus itself never got much attention from pharmaceutical companies. However there are drugs against coronaviruses that attack some animals. But these animal vaccines were found to be not very effective on humans. There are some bright spots in the research efforts against the SARS virus.

The strain of virus isolated from humans have not been able to infect many animals such as rabbits, mice etc. However, it has been successful in transmitting the infection to monkeys in studies done in Holland. This raises the hopes about the use of monkey to study the virus.