

SARS wars

As of mid-April, the war in Iraq had overshadowed a potential microbial “weapon of mass destruction” against all of humanity. SARS, or severe acute respiratory syndrome, hadn’t made much of a dent in the front page of most American newspapers and certainly had been given short shrift in airtime on the usual all-war, all-the-time cable television news channels. Yet in just over three months, more than 3000 people have contracted this disease of ambiguous etiology and more than 150 have died from it. Modest numbers at present, but capable of being multiplied geometrically in a very short time.

We have only recently come to know the cause of SARS. A review of information on the World Health Organization (www.who.int) and Centers for Disease Control and Prevention (www.cdc.gov) websites indicates SARS to be caused by a previously unknown variation of a coronavirus. Researchers at the University of Hong Kong have determined the genetic sequence of the SARS virus and shown that it came from animals. Scientists reporting in *The New England Journal of Medicine* have used the polymerase chain reaction (PCR) to show that SARS virus is only distantly related to previously sequenced coronaviruses. It is one of the true ironic sorrows of this disease that the person who originally identified it clinically, Dr. Carlo Urbani, a 46-year-old WHO physician and infectious disease specialist whose work defined SARS, died of the disease on March 29. Many have called for the virus, when finally and completely identified, to be named *Urbani*.

The criteria for positive identification of a disease microorganism such as that causing SARS came in the late 1800s from Robert Koch, a physician and early bacteriologist. The key points of Koch’s postulate are that a microorganism, to be deemed disease-causative, must be found in the infected host at every stage of the illness; that it must be able to be isolated and grown in culture; that healthy animals, when infected, must come down with the disease symptoms; and that the microorganism identical to the original must be able to be reisolated from the newly diseased animal. That level of definition hasn’t been made for SARS.

What we do know is that this is a highly contagious disease apparently transmitted by sneezing, coughing, or touching. We don’t know why there are apparent superspreaders—individuals who are extraordinarily contagious. In one case in Guangzhou, China, a severely ill 40-year-old man infected enough medical workers to fill an entire hospital ward. Only by using the most stringent infection control procedures, such as gowns, gloves, shoe covers, and face masks, was this hospital able to contain the outbreak.

Infectious diseases such as SARS are an enormous challenge for this time in the pharmaceutical industry. We need to develop laboratory tests that definitively identify the disease before it becomes contagious. Antibody- and fluorescence-based tests currently available can detect SARS only after the onset of clinical symptoms. Similarly, results from PCR-based tests are not always conclusive. We have only palliative medical treatments at present.

However, we do have drug discovery tools that are getting better every day. In the heat of battle with diseases such as SARS, we can only put up barriers to the disease. But the real war will be to truly understand the virus enemy that surrounds us. That one we can defeat as well.

