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MEDICINE

A DEADLY VIRUS ESCAPES

Concerns about lab security arise as a mysterious disease from Brazil strikes a Yale researcher

The accident must have come as a horrifying shock, even for an experienced scientist. One minute, a sample was spinning in a high-speed centrifuge. Then, suddenly, the container cracked, and the sample -- tissue contaminated by a rare, potentially lethal virus -- spattered the inside of the centrifuge. Fortunately, the Yale University researcher working with the deadly germs was wearing a lab gown, latex gloves and a mask, as required under federal guidelines. He also knew the proper procedure for dealing with a deadly spill: rub every surface with bleach, sterilize all instruments that have been exposed, then wipe everything down again with alcohol. There was just one rule he failed to follow. Having decided the danger was over, he didn't bother to report the accident, and a few days later he left town to visit an old friend in Boston.

Bad move. Although he would not realize it for about a week, the scientist -- his name has not been officially released -- had been infected with the mysterious Brazilian Sabia virus. Soon after he got back to Yale, he was running a fever that reached 103F. An experimental antiviral drug eventually stopped the illness, but the man had exposed five people, including two children, before being confined to a hospital isolation ward, and another 75 or so health-care workers after that. All of them are under observation. While the patient slowly recovered last week, Yale officials had to decide whether he would be disciplined for breaking lab rules. They also suspended all research on live Sabia virus and called in the federal Centers for Disease Control to evaluate the setup and procedures at the Yale Arbovirus Research Unit, where the accident took place. Says Dr. Peter Galbraith of the Connecticut health department: ``We are concerned that the incident was not reported immediately. But all our information at this point indicates it's a well-run lab."

Luckily, there was never much danger to the general public. The concerns will only intensify in the weeks ahead with the publication of the gripping book Hot Zone, about a deadly-virus crisis in Virginia in 1989 (see following stories). Sabia is almost certainly carried by rodents and is not contagious by casual contact (the afflicted scientist evidently got it from tiny bits of tissue that flew into his unprotected eyes or nose or both). The Yale lab, moreover, is classified as a level-3 biohazard facility, meaning, among other things, that it is kept at negative air pressure. Outside air can flow in through tiny cracks, but air flows out only via heavily filtered vents.

Even so, the accident has raised questions about whether such dangerous disease agents are being handled carefully enough. Sabia and several related viruses -- Junin, Machupo and Guanarito in South America and Lassa in Africa, all members of the arenavirus family -- are particularly frightening because they can kill in such a grisly way. Characteristic symptoms are high fever, uncontrolled bleeding in virtually every organ and finally shock. The liver turns yellow and decomposes. Blood can leak from literally every bodily orifice, including the eyes and the pores of the skin.

But while some other arenaviruses have been known to doctors for at least two decades, Sabia was never seen before 1990. In that year, a female agricultural engineer checked into a hospital in Sao Paulo, Brazil, with a high fever. Within days she was dead. Brazilian scientists tried to identify the infectious agent; one of their number fell ill and nearly died in the process. But they could determine only that it was a member of the arenavirus clan, so they sent a sample on to Yale for further identification.

It was the infected Yale researcher who originally helped show that this was a brand-new virus. That is still almost all scientists know about it. Says Dr. Robert Shope, director of the Yale virus lab: ``We're reasoning by analogy to other arenaviruses that Sabia has a rodent reservoir. Once the reservoir and transmission are understood, it should be possible to take measures to control the infection. This is our ultimate aim."

That is also the aim for the scores of other viruses that the Yale lab and a select few others in the U.S. receive constantly from around the world. Says Shope: ``About 100 of the viruses we have can infect people, and of those, 10% to 20% can kill." But even if scientists find ways to deal with all of those, there will always be more. New viruses are continually leaping from animal populations, where they have circulated harmlessly for years, into humans, and the problem has only become worse as people have moved into formerly uninhabited areas.

Yale officials said last week that they had never contemplated shutting down the research lab entirely. What they might have to consider, though, perhaps in consultation with the CDC, is treating Sabia virus as a so-called class 4 biohazard from now on, which means researchers will be able to handle it only inside a glove box or while wearing a space suit. Lassa and Guanarito are deemed class 4 already. The CDC might also do well to institute a rule that any unclassified infectious agent should be considered class 4 until proved otherwise.

Meanwhile, the first potential U.S. victims will be coming off Sabia watch next week; so far, nobody has shown any evidence of symptoms. They were lucky the Yale man was dealing with a virus that is not highly contagious. If researchers do not tighten some of their procedures, the next outbreak might not be so benign.

PHOTO: BIOHAZARD: The potentially lethal accident inside this Yale building was an unusual event for a ``well-run lab" (STEVE MILLER/AP)

PHOTO: A shattering test tube.

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BY MICHAEL D. LEMONICK Reported by Alice Park/New York

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