NEWS ARTICLE

Study warns of spreading 'superbug'

Antibiotic-resistant bacterium that causes severe infections has migrated from hospitals and now kills more Americans than AIDS.

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The number of severe infections by a "superbug," known as methicillin-resistant *Staphylococcus aureus*, is at least twice as high as researchers previously believed, and the bacterium now kills more Americans than AIDS, researchers reported today. The antibiotic-resistant infections, commonly called MRSA, were once confined to a few hospitals, but a new study by the national Centers for Disease Control and Prevention found that in 2005 they made an estimated 94,000 Americans seriously ill and killed almost 19,000, compared with 17,000 who died of AIDS. "Certainly, MRSA now has to be viewed as a very important target for prevention and control," said Dr. David A. Talan, an infectious diseases specialist at Olive View-UCLA Medical Center in Sylmar who was not involved in the study.

The infections have been a growing concern, particularly over the last decade, as they have spread outside hospitals, popping up in prisons, athletic fields and locker rooms. The study reported that nearly 14% of new antibiotic-resistant staph infections are not linked to hospitals or other medical facilities, indicating that the disease has become ingrained in parts of the wider community. The finding, reported in the Journal of the American Medical Assn., is the latest evidence of a widespread pattern of increasing drug resistance among a variety of infectious agents, including multidrug resistant tuberculosis, antibiotic-resistant *Clostridium difficile* and other once-innocuous organisms.

Some hospitals, gyms and other public facilities have begun to implement more stringent infection controls to prevent the spread of the bacterium, such as more thorough scrubbing of equipment, using hotter water for laundry, banning towel sharing and increasing the use of disinfectants. The bacterium also remains susceptible to some powerful and expensive antibiotics, such as vancomycin. But experts fear that the ability of the bacterium to mutate will outpace the ability of scientists to create new drugs. The spread of resistant organisms is "astounding," Dr. Elizabeth A. Bancroft, an epidemiologist with the Los Angeles County Department of Public Health, wrote in an editorial accompanying the report. Bancroft said the reported incidence of resistant staph infections is just "the tip of the iceberg" because the CDC researchers studied only blood-borne infections that find their way into internal organisms. Several studies have found that such infections represent only 6% to 9% of all MRSA infections, which can also thrive on the skin in a more innocuous form, waiting for the opportunity to enter the body. "It appears that the total burden of MRSA is much greater than what was estimated in this study," she said. Most forms of the staph bacterium are easily killed with common antibiotics, such as amoxicillin. But beginning in 1968, researchers began to see variants that required treatment with stronger antibiotics.

Experts attribute the emergence of the superbugs to indiscriminate use of antibiotics, the failure of patients to complete their antibiotic regimens and the use of antibiotics in animal feed. In each case, incomplete eradication of the bacteria leads to mutations that have increased resistance to the drugs. Confined to the surface of the skin, the bacteria do minimal damage. But in hospitals, nursing homes and dialysis centers, they can hitch a ride inside the body on needles and other invasive devices, spreading through the bloodstream and causing severe illness.

In the same fashion, they can be spread by tattooing and drug use in prisons and by cuts and abrasions on the athletic field. In 2003, four members of the USC football team were hospitalized and three more infected by MRSA. Doctors have been aware of the growing staph problem, but there were no hard data to document it. The new results were obtained by Dr. R. Monina Klevens of the CDC and her colleagues as part of the agency's ongoing Active Bacterial Core surveillance program, which monitors infections in nine regions of the U.S., including San Francisco, Baltimore, Atlanta and Denver. All infections were laboratory confirmed. The group observed 8,987 cases of blood-borne MRSA infections in the survey area, which was extrapolated to come up with a nationwide estimate of 94,360 cases. There were 1,598 deaths in the area, corresponding to 18,650 deaths nationwide. Only 26.6% of the cases were infections that occurred in hospitals. An additional 58.4% were infections that occurred in the community but were linked to hospitalization or medical procedures. Infections unrelated to medical procedures accounted for 13.7% of cases. Infection rates were highest among those older than 65, and African Americans were twice as likely as whites to suffer an infection. In both groups, Klevens said, the higher rates were most likely due to a higher incidence of chronic diseases, which both weaken patients and send them more often to the hospital, where they come in contact with the bacterium.

For infants younger than 1, the rate was four times as high in blacks as in whites. Healthcare advocates argue that hospitals need to improve hygiene. Some studies, for example, show that hospital workers wash their hands only about half as often as guidelines recommend. Other critics say hospitals should screen all newly admitted patients for MRSAs and isolate those found to be positive. Hospitals, however, say such isolated patients are likely to receive less care because of the inconvenience associated with entering their rooms. Despite the best efforts of scientists, the rapid evolution of bacteria gives them a major advantage, as illustrated by another report in the journal detailing the appearance of an ear infection resistant to all antibiotics approved for use in children.

Dr. Michael E. Pichichero and Dr. Janet R. Casey of the University of Rochester reported on nine ear infections caused by a multi-drug resistant strain of *Streptococcus pneumoniae* that succumbed only to a powerful antibiotic known as Levaquin, whose label carries a warning against using it in children. The first four children were successfully treated by inserting tubes in their ears, which allowed the infections to resolve naturally. The last five were given a ground-up Levaquin pill, which ended the infection with no adverse effects. Physicians agreed that Levaquin should be used in children only as a last resort, and only if the bacterium in question has been grown in culture and shown to be susceptible.