



Cystic Fibrosis Research News

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What was your research question?

Methicillin resistant *Staphylococcus aureus* (SA) is one of the most frequent bacteria infecting the lungs of children and adults with cystic fibrosis (CF). In recent years drug resistant strains of *S. aureus* (MRSA) increased globally and also in subjects with CF. There are different subtypes of MRSA. Here we characterized the types of MRSA that occur in people with CF in the U.S.

Why is this important?

MRSA infects 25% of all CF patients in the United States. Chronic infection may be associated with worse outcomes. There are different sub-types of MRSA and risk for getting a MRSA infection differs by type of MRSA.

- Community-acquired MRSA (CA-MRSA), is susceptible to a wider selection of antibiotics than HA-MRSA but can cause fatal pneumonia in previously healthy people
- Hospital-acquired (HA)-MRSA is more frequent in people with underlying disease and those getting a lot of antibiotics. HA-MRSA is resistant to more types of antibiotics than CA-MRSA.

What did you do?

In this study we collaborated with seven CF centers across the U.S. to obtain cultures from children (18 years or younger) with CF who were chronically



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infected with MRSA. We determined in the laboratory whether the samples cultured community-acquired or hospital-acquired MRSA. We then determined which antibiotics the MRSA bacteria were susceptible to.

What did you find?

We found that about two-thirds of all MRSA bacteria in the study were the hospital-acquired type. Most of the cultures were susceptible to long-established oral antibiotics, including

- Trimethoprim-sulfamethoxazole, known as Septra® or Bactrim®; and
- The class of antibiotics called tetracyclines, known as minocycline and doxycycline.

Most of the MRSA bacteria, especially hospital-acquired MRSA, were resistant to ciprofloxacin and azithromycin. We did not find any "super-resistant" MRSA, which would no longer be susceptible to vancomycin.

What does this mean and reasons for caution?

A significant increase in rates of MRSA infections in the CF community in the past decade make it important to understand which type of MRSA bacteria occur most frequently and which antibiotics can treat them.

One reason for caution is that this pattern of community compared to hospital acquired MRSA may change over time when new infections are acquired.

What's next?

Future studies should assess how the different types of MRSA infection impact health outcomes for people with CF.