Cystic Fibrosis Research News

Citation:

Heltshe SL, Saiman L, Popowitch EB, Miller MB, Kloster M, Thompson V, Ferkol TW, Hoover WC, Schechter MS, Muhlebach MS. Outcomes and Treatment of Chronic Methicillin-Resistant Staphylococcus aureus Differs by Staphylococcal Cassette Chromosome mec (SCCmec) Type in Children With Cystic Fibrosis. J Pediatric Infect Dis Soc. 2015 Sep;4(3):225-31. doi: 10.1093/jpids/piu048 PMID: 26336603

What was your research question?

The bacterium *Staphylococcus Aureus* can be resistant to commonly used antibiotics and is then called Methicillin Resistant *Staphylococcus aureus* (MRSA). There are different strains of MRSA. Here we evaluated if the health outcomes in people with CF differed depending on the two main types of MRSA seen in the US.

Why is this important?

Studies using the CF Registry have shown worse health in people with chronic MRSA. Yet there are different types of MRSA: community-acquired MRSA (CA-MRSA) is susceptible to a wider selection of antibiotics, but can cause fatal pneumonia in previously healthy children. Hospital-acquired MRSA (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.

The type of MRSA might influence patient outcomes, and treatment may need to be adjusted depending on the MRSA strain.

What did you do?

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In this study, we collaborated with seven CF centers and obtained MRSA samples from children/young adults (not older than 18 years) with CF who were chronically infected with MRSA. In the laboratory, we determined which type of MRSA these were, either CA-MRSA or HA-MRSA. With permission from the patients who gave the MRSA, the CF centers provided information on frequency and type of antibiotic treatment for up to 3 years since the MRSA sample was collected. Additional data for lung function, weight and variables such as genotype were obtained from the CF Foundation Patient Registry (CFFPR).

What did you find?

We found that two-thirds of the subjects had the HA-MRSA and one third the CA-MRSA type. Those with HA-MRSA had had the infection for longer, but at study start the subjects had similar lung function and nutritional status. Antibiotics were prescribed at more than half of all clinic visits for both groups. Those subjects with HA-MRSA were more frequently prescribed oral antibiotics and also had more frequent exacerbations (symptoms that we could classify as a "flare up" based on pre-defined criteria).

What does this mean and reasons for caution?

The finding that those with HA-MRSA had more frequent flare-ups could mean that HA-MRSA may be associated with more frequent need for antibiotics. Because this is an observational study we cannot say for sure that the HA-MRSA is **causing** this worse disease. Other reasons may be the longer duration of infection with HA-MRSA – the HA-MRSA patients in our study had had MRSA for longer than the CA-MRSA patients. Also, there may be patient-related factors that we could not capture that contribute to these outcomes.

What's next?

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It will be important to study people with CF starting from the time they get first infected with MRSA to assess how this affects the outcome. We also need to study whether antibiotic therapy used at time of initial infection is equally effective in treating the MRSA types.