

Cystic Fibrosis Research News

Title:

MOLECULAR EPIDEMIOLOGY OF *MYCOBACTERIUM ABSCESSUS* COMPLEX ISOLATES IN IRELAND

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What was your research question?

We studied 36 samples of an unusual bacterium, *Mycobacterium abscessus*, mainly isolated from spittle. A small minority of cystic fibrosis patients everywhere are infected with this. We wanted to know if the bacteria from Ireland were all the same, and how similar they were to strains from other countries.

Why is this important?

Although this infection is rare (usually less than 1 in 30 patients) it is difficult to treat with antibiotics, and after lung transplant may worsen to cause severe illness. Because of this, some centres will not transplant patients infected with this bacterium. Recently in England

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one type was shown to have spread between cystic fibrosis patients at one hospital. Ireland has the highest incidence of cystic fibrosis in Europe, but is an island separated from other countries. Until this study we didn't know whether standard varieties of this organism were infecting Irish patients, and whether patients were infecting one another.

What did you do?

We used *Mycobacterium abscessus* bacteria grown from patients in Ireland between 2006 and 2012. At least half of the bacteria were from spittle of CF patients, the approval conditions of the study meant we didn't know about the other half of the patients. We extracted DNA from bacteria and compared the DNA sequences of the same small fragments with previous results for *Mycobacterium abscessus* strains from all over the world. We put different bacteria whose sequences were the same in the same group, and worked out how closely the bacteria were related by the differences between sequences of different groups.

What did you find?

The infection was about as common in cystic fibrosis patients in Ireland (1 in 50) as in other countries. Our typing method worked well and we found twenty-two different individual bacterial types. The leading groups present in Ireland were similar to those from cystic fibrosis patients in other European countries. About 20% were completely different. A type similar to those shown to spread in the English hospital was present in two patients at different times, but we would need more detailed research to show if these bacteria were the same.

What does this mean and reasons for caution?

Patients in Ireland probably pick up this infection from the environment, not from each other. This is the conclusion of most other reports. We have some similar strains to those seen in other countries, but this is probably because these strains are common in the environment and good at transferring to patients rather than spreading between patients. However, our typing method used a fraction of the genes in the bacterium and we did not



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decipher the whole DNA sequence of the bacterium. This most detailed level of typing was needed to show the spread of infection between patients in England.

What's next?

Our typing method works well and would give early warning of an outbreak (bacteria spreading between patients) in Ireland. We will carry on typing strains and sequence some of them in more detail, including the two strains we found of the same type shown to spread between patients in England.

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