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Cystic Fibrosis Research News

Title:

Frequent microbiological surveillance during inpatient cystic fibrosis pulmonary exacerbations has limited clinical value

Lay Title:

Repeating bacterial cultures in people with cystic fibrosis (CF) hospitalised with chest exacerbations may not be useful

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What was your research question?

How often were bacterial cultures performed on the inpatient service at our children's hospital for CF chest exacerbations?

1) Did the culture results show different bacteria from previous cultures and did this result change antibiotic treatment?
2) Are repeat cultures cost-effective?

Why is this important?

Obtaining routine bacterial cultures is central to the care of people with CF. Care guidelines suggest quarterly microbiological monitoring with additional cultures during chest exacerbations (flares in symptoms, typically treated with antibiotics). However, the frequency with which cultures should be obtained during exacerbations is not known. In this study, we reviewed our local practice of performing cultures on admission and weekly thereafter. This review will help define how often we should be taking samples from the airways of people with CF admitted for chest exacerbations.

What did you do?

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We examined all CF-related hospital admissions from 2015-2019 at our hospital. We collected the results of bacterial cultures grown from airway samples across all admissions and all antibiotic treatments given. We evaluated how often bacterial cultures identified new types of bacterial and related the growth of these new bacteria to a subsequent change in antibiotic management. We analysed the costs of our practice.

What did you find?

Amongst 78 people/children with CF with 224 admissions, almost all had a culture taken in clinic before being admitted and at the time of hospital admission, with decreasing cultures thereafter. Only 37% of admissions showed a growth of new bacteria over the course of the hospital stay, with the most new growth occurring at admission. Doctors changed the antibiotics in only 36% of cases after the growth of new bacteria and they were most likely to occur after culture 2 (on admission to hospital). In the cost-benefit analysis, we saw that we could leave out later cultures representing cost-savings over 50% with very few missed new bacterial species and no significant change to treatment.

What does this mean and reasons for caution?

This study highlights the limited clinical benefits from repeating bacterial airway cultures during CF chest exacerbations. Most cultures did not show new bacterial growth, but if they did, it was most likely to occur on admission to hospital. Antibiotic changes were also mainly made after this culture on admission. Further inpatient cultures did not change treatment and resulted in increases health-care expenditures.

The results of this study were based only from a single centre with a relatively small number of admissions. Accuracy of data is limited the fact that the data were collected by reviewing charts, meaning that more subtle factors impacting doctors' decision-making may not have been captured if they weren't written down.

What's next?

Confirmation of these results from other centers would be useful, and could help to update CF care guidelines. Further, we do not know how treatment with highly effective CFTR modulators will affect our conclusions.

Original manuscript in citation in PubMed

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