**Title:** Monitoring early antibiotic treatment with anti-Pseudomonas aeruginosa serology: a comparison of two specific antibody panels

**Lay Title:** Testing blood for antibodies against the *bacteria Pseudomonas aeruginosa* to track early antibiotic treatment

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**What was your research question?**

Could blood tests measuring antibodies to *Pseudomonas aeruginosa* help to monitor the effectiveness of early antibiotic treatment for people with cystic fibrosis? How do two commercial antibody panels compare in terms of detecting the immune response and predicting treatment outcomes?

**Why is this important?**

It is very important to detect and treat infection with *Pseudomonas aeruginosa* in people with cystic fibrosis as soon as possible. This is because if it is not treated, it can cause long-term lung damage. However, checking for signs of infection in the lungs using a special sample from the patient's lungs can be difficult, especially in children who cannot easily cough up sputum. Serological tests, which check the body's antibody response, offer a non-invasive alternative. If we can understand how well these tests show how well treatment is working, we can give patients better care by helping doctors to make more informed decisions. This study shows that serology can be a useful tool alongside traditional methods and supports the use of specific antibody levels in initial infections.

**What did you do?**

We studied 134 children and young adults with cystic fibrosis. These people had experienced 170 initial *Pseudomonas aeruginosa* infections over 14 years. All of them were given antibiotics as soon as possible. We used 333 blood samples to test two kits that measure how the immune system responds to infection and how it responds 12 months after treatment. We looked at how well each test could detect an infection and if having high levels of antibodies meant that a patient would do better or worse. We also found the best levels of antibodies to use to check for disease. The two panels showed similar results in monitoring how patients responded to treatment.

**What did you find?**

Successful early antibiotic treatment led to lower antibody levels after 12 months, while higher levels indicated treatment failure. But if they did not get better, their antibody levels were higher. Both antibody panels were accurate enough to diagnose the disease, with the one antigen (ExoA) being very specific and quite sensitive. All the tested antigens showed a clear link between antibody levels and the results of microbiological tests. There were no major differences in performance between the two test kits. These findings suggest that serology can support traditional methods in monitoring early *Pseudomonas aeruginosa* treatment in people with cystic fibrosis.

**What does this mean and reasons for caution?**

This study suggests that antibody tests can help to see if cystic fibrosis patients are responding well to treatment for *Pseudomonas aeruginosa* infections. However, the levels of antibodies in the blood can vary between individuals and may be influenced by factors like previous infections or differences in immune response. The tests should be used alongside, not instead of, standard methods. Also, the study focused on patients not using newer cystic fibrosis modulators, so results may differ with current treatments. Further research is needed to confirm these findings in broader patient groups and to refine antibody cut-offs for clinical use.

**What’s next?**

In the future, we should test these antibody tests on patients using cystic fibrosis modulators and look into combining serology with other monitoring tools. Developing standardized guidelines for antibody cut-offs could improve clinical decision-making and support earlier, more personalized treatment to better prevent chronic *Pseudomonas aeruginosa* infections.

**Original manuscript citation in PubMed**

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