TEST

Coccidioides complement fixation

A blood test that measures IgG antibodies produced in response to Coccidioides fungi

WHAT IT MEASURES
IgG antibodies against Coccidioides fungi

SAMPLE
Blood; sometimes spinal fluid

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually under 10 minutes

RESULTS IN
Several days; timing varies by laboratory

USED FOR
Supporting diagnosis and monitoring coccidioidomycosis

MAIN LIMITATION
Early or weakened immune responses can produce negative results

Overview

Coccidioides complement fixation is an antibody test used when coccidioidomycosis, also called Valley fever, is suspected or being monitored. Valley fever is caused by breathing in spores from Coccidioides fungi, which live in soil in parts of the Americas.

The test usually uses blood. It looks for immunoglobulin G, or IgG, antibodies made by your immune system in response to the fungus. In certain situations, such as possible infection around the brain and spinal cord, the laboratory may test cerebrospinal fluid obtained through a lumbar puncture.

"Complement fixation" describes the laboratory method. Your sample is mixed with fungal material and proteins called complement. The reaction shows whether relevant antibodies are present and allows the laboratory to report an antibody level, called a titer.

This test does not find the fungus itself. It measures your immune response, so the timing of testing and the strength of that response matter.

Why the test is ordered

The test can help support a diagnosis of coccidioidomycosis when your symptoms and exposure history fit the infection. Possible symptoms include cough, fever, tiredness, chest pain, shortness of breath, joint pain, or a rash. These symptoms have many possible causes, so the result is interpreted with other information.

A complement fixation titer may also be followed after coccidioidomycosis has been diagnosed. Changes over time can provide information about disease activity, although the titer should not be used alone to decide whether an infection is improving or worsening.

The test may be ordered to:

It is not usually a stand-alone screening test for everyone who has lived in or visited an affected area.

- Support a diagnosis after possible exposure in an affected region
- Help assess the extent of a known infection
- Follow antibody levels during or after treatment
- Investigate possible spread beyond the lungs
- Test spinal fluid when coccidioidal meningitis is suspected

Who should have the test

You may be offered testing if you have compatible symptoms and have lived in or travelled to a place where Coccidioides is found. In the United States, this includes parts of Arizona, California, Nevada, New Mexico, Texas, Utah, and nearby areas, although the fungus is not limited by state borders.

Testing may also be appropriate if imaging shows an unexplained lung abnormality or if symptoms continue despite treatment for another suspected respiratory illness.

If you already have coccidioidomycosis, repeat complement fixation tests may be used as part of follow-up. The timing is based on your symptoms, the location and severity of infection, treatment, and previous results.

People with weakened immune systems may not produce enough antibodies for the test to detect. In that situation, a negative result cannot reliably exclude infection, and other tests may be needed.

How to prepare

No fasting is required. You can usually eat, drink water, and take your usual medicines before a blood test. Coffee does not directly alter the antibody result, although drinking water may make the blood draw easier.

Tell the healthcare professional ordering the test about medicines that suppress the immune system, including corticosteroids like prednisone or hydrocortisone , chemotherapy, transplant medicines, and some treatments for inflammatory conditions. These medicines can weaken antibody production.

Also mention recent blood or plasma transfusions, intravenous immunoglobulin, pregnancy, and any antifungal treatment. Do not stop a prescribed medicine unless the clinician managing it tells you to do so.

If cerebrospinal fluid testing is planned, preparation is different because the sample is collected by lumbar puncture. You should receive specific instructions about medicines, bleeding risks, and what the procedure involves.

What happens during the test

For a blood test, a healthcare professional places a band around your upper arm and cleans the skin. A small needle is inserted into a vein, usually inside the elbow, and blood is collected into a tube.

The draw normally takes only a few minutes. You may feel a brief scratch or sting. A dressing is placed over the site afterward.

The laboratory may test complement fixation by itself or alongside other Coccidioides antibody methods, such as enzyme immunoassay or immunodiffusion. These tests detect antibodies in different ways and can provide complementary information.

A lumbar puncture is a separate procedure. A needle is inserted into the lower back to collect a small amount of cerebrospinal fluid. It requires more preparation and has different risks from a routine blood draw.

Understanding your results

Results may be reported as negative or as a titer. A titer shows how far the sample could be diluted while antibodies were still detected. For example, a titer of 1:16 represents more detectable antibody than 1:4.

A positive result supports current or previous infection with Coccidioides , but it does not prove by itself that the fungus is causing your current symptoms. Low titers can occur with limited infection, improving infection, or past infection. Occasionally, a result may be falsely positive.

Higher titers are more often seen with a greater amount of active disease or infection outside the lungs. However, there is substantial overlap. Some people with serious infection have modest or negative titers, while others remain well despite a detectable titer.

A negative result means antibodies were not detected by this method. It does not completely rule out coccidioidomycosis, especially early in the illness or when immune function is reduced.

Trends are often more useful than one result. A rising titer can support increasing activity, while a falling titer may accompany improvement. Small changes can reflect normal laboratory variation.

Reference values and interpretation vary by laboratory, test method, age, sex, pregnancy status, medicines, and clinical context. Results are best compared using the same laboratory when possible.

What affects the results

The main factors involve your immune response, the timing of the sample, and how the test is performed.

Food, coffee, exercise, time of day, and kidney function are not known to meaningfully change this antibody titer. Pregnancy does not usually interfere directly with the assay, but it can change the medical importance of a possible infection.

- Early testing: IgG antibodies may not yet be detectable during the first part of an illness.
- Reduced immune function: Immune-suppressing illnesses or medicines can cause a weak or negative antibody result despite infection.
- Antifungal treatment: Treatment may affect antibody patterns over time, but a falling titer does not by itself prove that infection has cleared.
- Past infection: Antibodies can remain detectable after symptoms have resolved.
- Recent transfusion or immunoglobulin: Donated antibodies may occasionally complicate interpretation.
- Other fungal antibodies: Cross-reactions or nonspecific reactions can sometimes produce a positive or unclear result.

- Specimen quality: A damaged, contaminated, or "anticomplementary" sample may prevent reliable interpretation.
- Laboratory method: Antigens, procedures, and reporting practices differ, so titers from different laboratories may not match exactly.

Accuracy and limitations

There is no single percentage describing how often complement fixation is correct. Performance changes with the stage and location of infection, immune function, specimen type, and laboratory method.

The test can miss coccidioidomycosis when testing occurs before IgG antibodies develop. It can also miss localized infection or infection in someone whose immune system cannot make a strong antibody response.

A positive result can occasionally occur when active coccidioidomycosis is not present. Possible explanations include antibodies left from an earlier infection, cross-reactions, nonspecific laboratory reactions, or passively transferred antibodies.

Other antibody methods are often used with complement fixation. If the antibody result does not fit your symptoms, direct tests may be more useful. These include fungal culture, examination of tissue under a microscope, antigen testing in selected cases, or molecular tests where available.

Culture or tissue testing can show the fungus directly, but these tests may also miss infection and may require an invasive sample. No single result should be interpreted in isolation.

Risks and complications

A blood draw may cause a small bruise, brief soreness, or light-headedness. Serious complications are uncommon.

A lumbar puncture has additional risks, including headache, back discomfort, bleeding, and infection. These should be discussed before the procedure.

What happens next

If the result is negative but symptoms and exposure still suggest coccidioidomycosis, repeat antibody testing or a different test may be considered. Antibodies can take time to appear.

A positive result is reviewed alongside your symptoms, examination, imaging, other laboratory tests, and previous titers. Routine follow-up may involve another blood test to see whether the titer is stable, rising, or falling.

Contact your healthcare team promptly for worsening shortness of breath, persistent high fever, a severe or new headache, neck stiffness, confusion, weakness, or new problems with balance or vision.

Seek emergency care for severe difficulty breathing, bluish or grey lips, collapse, marked confusion, a seizure, or sudden one-sided weakness. These symptoms require urgent assessment regardless of the antibody result.

Common questions

Can I drink coffee before the test?

Yes. Coffee does not directly affect Coccidioides antibodies. Unless you are having another fasting test at the same appointment, you can usually eat and drink normally.

Does the time of day matter?

No. Antibody levels are not expected to change meaningfully over the course of a day.

Can I exercise beforehand?

Yes. Ordinary exercise does not alter the result. If exercise often makes you faint or dehydrated during blood draws, rest and drink water first.

Should I stop my medicines?

No, not unless you have been specifically told to do so. Tell the healthcare professional about immune-suppressing medicines, antifungal treatment, recent intravenous immunoglobulin, or transfusions.

Why was my result negative if Valley fever is still suspected?

The sample may have been collected before antibodies developed, or your immune response may be weak. Repeat testing or a test that looks directly for the fungus may be considered.

Why are my titers different between laboratories?

Laboratories may use different fungal antigens, procedures, and reporting systems. For monitoring, results from the same laboratory are usually easier to compare.

Sources

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