TEST

Immunoelectrophoresis - blood

A blood test that separates antibody proteins to look for unusual patterns.

WHAT IT MEASURES
Protein types and patterns, especially antibodies, in blood serum

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually under five minutes for the blood draw

RESULTS IN
Several days; turnaround differs between laboratories

USED FOR
Investigating and monitoring abnormal blood proteins

MAIN LIMITATION
Small abnormal proteins may be missed by this older method

Overview

Blood immunoelectrophoresis is a laboratory test that separates and identifies proteins in the liquid part of your blood, called serum. It focuses mainly on immunoglobulins, also known as antibodies.

Antibodies are made by immune cells. They usually form a varied mixture because they respond to many different infections and other immune signals. Some conditions cause one group of cells to make a large amount of a single antibody. This is called a monoclonal protein, M protein, or paraprotein.

During immunoelectrophoresis, serum proteins are separated in a gel according to their electrical charge. Antibodies made in the laboratory are then added. Visible curved lines form where particular proteins react. A laboratory specialist examines the position, shape, and strength of these lines.

This is an older technique. Many laboratories now use serum protein electrophoresis, immunofixation, and serum free light-chain testing because these methods can identify smaller abnormal proteins more clearly. A report may still use the term

"immunoelectrophoresis" loosely for related protein studies, so it is worth checking exactly which method was performed.

Why the test is ordered

The test may be ordered when other blood or urine results suggest an unusual amount or type of protein. It can help investigate whether an antibody pattern is broad and reactive or comes mainly from one group of cells.

Reasons for testing may include:

These findings have many possible causes. Immunoelectrophoresis does not establish a diagnosis by itself.

- An abnormal total protein or serum protein electrophoresis result
- Unexplained changes in blood counts, kidney function, or calcium
- Symptoms such as persistent numbness, weakness, bone pain, or fatigue
- Investigation of certain immune, blood, liver, or kidney conditions
- Follow-up of a previously identified abnormal protein

Who should have the test

This is not generally used as a routine screening test for people without symptoms or abnormal laboratory findings. You may be offered it when your history, examination, or another test gives a specific reason to examine your blood proteins.

If an abnormal protein is already known, testing may be repeated to help monitor it. However, the same laboratory method should ideally be used each time because different methods may not produce directly comparable results.

Current testing often begins with serum protein electrophoresis and serum free light chains. Immunofixation may then be used to identify the exact antibody type. The most suitable combination depends on what is being investigated.

How to prepare

Fasting is not usually needed. You can normally eat and drink as usual, including drinking water.

Take your regular medicines unless you have been given different instructions. Tell the

healthcare professional arranging the test about prescription medicines, non-prescription products, recent antibody treatments, intravenous immunoglobulin, and any recent blood transfusion. These can affect how the pattern is interpreted.

Bring information about earlier protein test results if they were performed elsewhere. Comparing patterns over time can be useful.

What happens during the test

A healthcare professional places a small needle into a vein, usually inside your elbow or on the back of your hand. Blood is collected into a tube. The draw commonly takes less than five minutes.

The sample is allowed to clot so the laboratory can separate the serum from the blood cells. The serum is then placed in a gel, exposed to an electrical current, and tested with antibodies that react with specific human proteins.

You can usually leave immediately after the blood draw and return to normal activities.

Understanding your results

Immunoelectrophoresis is mainly interpreted as a pattern rather than against one universal reference range. The report may describe a normal pattern, a broad increase, a restricted or monoclonal protein, or reduced antibody levels.

A broad increase in several antibody types is called a polyclonal pattern . It can occur when the immune system is active, including during inflammation, infection, autoimmune disease, or some liver conditions. The pattern does not identify the cause.

A monoclonal pattern suggests that many copies of one antibody are present. The report may name its heavy-chain type, such as IgG, IgA, or IgM, and its light-chain type, called kappa or lambda. Monoclonal proteins can occur in several settings, including conditions that need only monitoring and conditions that need further assessment.

A result showing no monoclonal protein does not completely rule one out. A small amount may be below the test's detection level, or the protein may consist mainly of free light chains that are better assessed with another test.

Interpretation varies by laboratory method, age, sex, pregnancy status, medicines, kidney function, and the clinical reason for testing. Any numeric measurements should be compared with the reference interval printed by the laboratory that performed the test.

What affects the results

Several factors can change the protein pattern even when the laboratory has performed the test correctly.

Recent intravenous immunoglobulin, or IVIG, adds donated antibodies to your blood. It can produce temporary bands that resemble an abnormal protein. A recent blood or plasma transfusion may have a similar effect.

Therapeutic monoclonal antibodies are medicines designed to act like one specific antibody. Some can appear on electrophoresis or immunofixation and be mistaken for a protein produced by your body. The laboratory may need the medicine's name and the date of your last treatment.

A recent infection, vaccination, inflammatory illness, or autoimmune flare can cause a broad antibody increase. This is a real biological change, not a false laboratory result, but it may complicate interpretation.

Kidney and liver function can change protein concentrations and related tests. Pregnancy, age, hydration, and severe protein loss may also alter the background pattern. Sex usually has less effect on the pattern itself but may matter when related laboratory results are considered.

The sample must be serum. If plasma is tested accidentally, fibrinogen-a clotting protein-can create a band that may be confused with a monoclonal protein.

Accuracy and limitations

There is no single percentage describing how often immunoelectrophoresis is right or wrong. Its performance depends on the amount and type of protein, the antisera used, sample quality, and the laboratory method.

The test can miss small monoclonal proteins. It is also less reliable for free light chains, which may be present in low amounts in blood or pass into urine. Immunofixation is generally better at confirming and identifying a small abnormal protein. Serum free light-chain testing is better for measuring unbound kappa and lambda light chains.

The test can also appear to show a monoclonal protein when the band comes from a medicine, IVIG, transfused proteins, fibrinogen, or a temporary immune response. Further testing can help separate these possibilities.

When a monoclonal protein disorder is being investigated, a combination of serum protein electrophoresis and serum free light chains is commonly used. Immunofixation can confirm the protein type. Urine testing may also be important in certain clinical situations. No single

test finds every abnormal protein.

Risks and complications

The blood draw may cause a small bruise, brief soreness, or light-headedness. Serious complications from a routine blood sample are uncommon.

What happens next

A normal-looking result may complete the investigation, or other testing may continue if symptoms or previous results remain unexplained.

An unusual pattern usually leads to routine follow-up rather than emergency treatment. Follow-up may include serum protein electrophoresis, immunofixation, serum free light chains, urine protein studies, blood counts, calcium testing, or kidney and liver tests. Sometimes the test is repeated after a temporary illness or after enough time has passed since IVIG, a transfusion, or antibody treatment.

A monoclonal protein does not by itself show why it is present or whether treatment is needed. Its amount, type, change over time, and effects on your health all matter.

Do not wait for a routine test appointment or result if you develop severe difficulty breathing, chest pain, sudden confusion or weakness, or a major reduction in urine output. These symptoms need urgent medical assessment regardless of the immunoelectrophoresis result.

Common questions

Can I drink coffee before the test?

Usually, yes. Fasting is not normally required. Follow any separate instructions if other fasting blood tests are being collected at the same appointment.

Does the time of day matter?

Usually not. The test can generally be collected at any time, although repeat samples may be scheduled consistently for easier comparison.

Can I exercise beforehand?

Normal activity is unlikely to meaningfully affect this test. Very strenuous exercise can temporarily alter some blood proteins and hydration, so mention it if you exercised intensely shortly before the sample.

Should I stop my medicines?

Do not stop prescribed medicines unless you have been told to do so. Give the testing team a current medicine list, especially if you receive monoclonal antibody treatment or IVIG.

Does an abnormal result mean cancer?

No. Abnormal patterns have several possible causes, and some monoclonal proteins remain stable without causing illness. Other tests and your clinical history are needed to understand the result.

Why has another laboratory called the test immunofixation?

The names are sometimes used loosely, but the methods are not identical. Immunofixation is a newer, more sensitive method often used to confirm the type of an abnormal antibody protein.

Sources

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