TEST

Tensilon test

A Tensilon test checks whether edrophonium briefly improves muscle weakness.

WHAT IT MEASURES
Brief improvement in weakness after edrophonium

SAMPLE
None; medicine is given through a vein

FASTING NEEDED?
No, unless your testing centre gives different instructions

HOW LONG IT TAKES
About 30 minutes, plus brief observation

RESULTS IN
Immediately, because improvement is observed during testing

USED FOR
Diagnosis of myasthenia gravis, now rarely

MAIN LIMITATION
Subjective responses can produce misleading positive or negative results

Overview

The Tensilon test is an older test used to help diagnose myasthenia gravis , a condition that causes muscles to become weak and tire easily. It is also called an edrophonium test because Tensilon was a brand name for edrophonium chloride .

Edrophonium briefly blocks the breakdown of acetylcholine. Acetylcholine is a chemical that carries signals from nerves to muscles. In myasthenia gravis, these signals do not reach the muscles effectively. Edrophonium can temporarily strengthen the signal.

During the test, edrophonium is injected into a vein while a clinician watches for a clear, measurable improvement in weakness. For example, a drooping eyelid may lift or an eye movement may improve. The effect begins within seconds and usually lasts only a few minutes.

The Tensilon test is now rarely used. Edrophonium is unavailable in many places, the response can be difficult to interpret, and the medicine can cause significant side effects. Antibody blood tests and electrical tests of nerves and muscles are usually preferred.[1-3]

Why the test is ordered

A specialist may consider this test when myasthenia gravis is suspected and there is weakness that can be assessed before and after the injection.

Symptoms that may lead to an assessment for myasthenia gravis include:

These symptoms have many possible causes. Having one of them does not mean that you have myasthenia gravis.

Historically, edrophonium was also used to assess sudden worsening in someone already diagnosed with myasthenia gravis. This is no longer considered a reliable or safe way to make urgent treatment decisions.

- Drooping of one or both eyelids
- Double vision
- Weakness that becomes more noticeable with activity
- Difficulty speaking, chewing, or swallowing
- Weakness of the neck, arms, or legs

Who should have the test

The Tensilon test is not a screening test and is not suitable for home use. It may be offered to a small number of people after assessment by a neurologist or another clinician experienced in neuromuscular conditions.

It is most informative when you have visible or measurable weakness at the time of testing. If your strength is normal during the appointment, there may be little change to observe.

Edrophonium can slow the heart, affect blood pressure, and tighten the airways. Before recommending it, the clinical team will consider your heart rhythm, breathing conditions, current medicines, pregnancy status, and general health. A different test may be safer if these factors increase your risk.

How to prepare

Follow the instructions from the centre performing the test. Fasting is not usually needed, but local arrangements may differ.

Give the team a complete list of your prescription medicines, over-the-counter products, and

supplements. In particular, tell them if you take pyridostigmine or another medicine for myasthenia gravis. These medicines can change the response to edrophonium.

Do not stop pyridostigmine, heart medicines, or any other treatment unless the clinician arranging the test specifically tells you to do so.

Tell the team if you:

Try to avoid unusually strenuous exercise before the appointment. Exercise and fatigue can temporarily alter muscle strength, making the baseline assessment harder to interpret.

- Have asthma or another condition that affects your breathing
- Have an irregular or unusually slow heartbeat
- Have fainted during injections or medical procedures
- Are pregnant or could be pregnant
- Have previously reacted to edrophonium or atropine

What happens during the test

The test must be performed where your heart rate, blood pressure, breathing, and response to the medicine can be monitored.

Before the injection, a clinician examines the weakness they intend to measure. You may be asked to look upward, open and close your eyes, hold your arms out, count aloud, or repeat another movement until weakness appears.

An intravenous line, or IV, is placed in a vein. Monitoring equipment may be attached to check your heartbeat, blood pressure, and oxygen level.

Edrophonium is then given in small amounts. The clinician repeats the same strength test and looks for an immediate, objective change. Some centres may first give saline, which contains no active medicine, to help distinguish a true physical response from a change caused by expectation.

Atropine, a medicine that can reverse some unwanted effects of edrophonium, must be readily available. The test is stopped if you develop concerning symptoms. You may be observed briefly after the drug's effect has worn off.[4]

Understanding your results

There is no universal numerical reference range or laboratory cutoff for a Tensilon test. The

result is based on an observed change in muscle function.

A positive result means there was a clear, brief, and measurable improvement after edrophonium. This may support a diagnosis of myasthenia gravis, but it does not prove the diagnosis by itself.

A negative result means no convincing improvement was seen. This does not rule out myasthenia gravis. Weakness may have been too mild, the muscle tested may not have responded clearly, or treatment may have affected the result.

An uncertain result means the change was too small or subjective to interpret confidently.

Because this is not a laboratory measurement, laboratory reference ranges do not apply. Interpretation still varies with the testing protocol, age, sex, pregnancy status, medicines, existing conditions, and the overall clinical context.

What affects the results

The test works best when there is clear weakness to compare before and after the injection. Several factors can make the result misleading even when the medicine and equipment work correctly.

These include:

A recent blood transfusion, iron deficiency, kidney function, and red blood cell turnover do not directly affect this test in the way they can affect some blood tests.

- Fluctuating weakness: Myasthenia symptoms can change from hour to hour.
- Recent activity: Exercise, repeated movement, rest, and sleep can alter strength.
- Myasthenia medicines: Pyridostigmine and similar medicines may reduce the visible difference after edrophonium.
- The muscle being tested: Eyelid movement is easier to observe than a vague change in general energy or strength.
- Expectation and effort: Knowing that a drug has been given can change effort or how improvement is reported.
- Other neurological conditions: Some disorders can produce temporary or apparent improvement, creating a false-positive result.
- Dose and timing: The effect is brief, so an assessment made too early or too late may miss it.

- Examiner judgement: Small changes can be interpreted differently unless a clear measurement or recording is used.

Accuracy and limitations

The Tensilon test can be right when a clear, objective weakness improves immediately. However, there is no single reliable figure for how often it correctly identifies or excludes myasthenia gravis. Published accuracy differs according to the muscles affected, the test method, and what was accepted as a positive response.

The test can miss myasthenia gravis when weakness is absent or mild during the appointment. It can also appear positive when the improvement reflects effort, expectation, examiner judgement, or another neurological condition.

Its other major limitation is safety. Even though edrophonium acts for only a short time, it can affect the heart and breathing. These limitations, along with reduced availability, are why the test has largely been replaced.[1-3]

Tests that may provide more useful evidence include:

No single test answers every case. Results are interpreted alongside your symptoms and neurological examination.

- Blood tests for acetylcholine receptor, MuSK, or other relevant antibodies
- Repetitive nerve stimulation
- Single-fibre electromyography, which measures communication between nerves and muscles
- An ice-pack test for certain cases of eyelid drooping

Risks and complications

Common short-lived effects include sweating, watering eyes, increased saliva, nausea, stomach cramps, diarrhoea, muscle twitching, and an urgent need to urinate.

More serious reactions can include a very slow heartbeat, abnormal heart rhythm, low blood pressure, fainting, or tightening of the airways. This is why monitoring, resuscitation equipment, and atropine are required during the test.[4]

The IV may cause brief discomfort, a small bruise, or light-headedness.

Tell the testing team immediately if you feel faint or develop chest discomfort, wheezing,

severe nausea, or difficulty breathing. After leaving, seek emergency help for trouble breathing, collapse, blue or grey lips, or severe chest pain. Mild bruising at the IV site can usually be discussed at routine follow-up.

What happens next

The clinician may discuss the observed result with you immediately, although the final interpretation may wait until it is reviewed with your examination and other test results.

A positive response is usually followed by further testing rather than treated as proof of myasthenia gravis. A negative or uncertain response may also lead to antibody blood tests or electrical nerve and muscle testing.

If your symptoms are stable, attend the planned follow-up appointment to discuss the full assessment.

Seek urgent medical advice if weakness is rapidly worsening or swallowing is becoming difficult. Call emergency services if you cannot breathe comfortably, cannot manage your saliva, are choking, or become faint or unresponsive. Do not wait for a routine test appointment in these situations.

Common questions

Can I drink coffee before a Tensilon test?

Usually, yes. Coffee does not directly change how edrophonium works, but caffeine can affect your pulse or make you feel shaky. Follow any instructions from the testing centre.

Does the time of day matter?

It can. Myasthenia-related weakness often fluctuates, so the test may be easier to interpret when your usual weakness is present. Tell the team when your symptoms tend to be most noticeable.

Can I exercise beforehand?

Avoid unusually strenuous exercise unless you are told otherwise. Exercise may temporarily increase weakness and change the baseline assessment. Normal gentle activity is usually acceptable.

Should I take pyridostigmine before the test?

Only follow the instructions given by the clinician arranging the test. Pyridostigmine can affect the response, but stopping it without advice could worsen your symptoms.

Can I drive home afterward?

Edrophonium wears off quickly, and sedation is not normally used. However, ask the testing centre in advance, especially if you have significant weakness, double vision, or a history of fainting.

Is the Tensilon test painful?

You may feel a brief sting when the IV is inserted. The medicine itself can cause temporary cramps, twitching, nausea, sweating, or other uncomfortable effects.

Sources

- [1] Gilhus NE, Tzartos S, Evoli A, Palace J, Burns TM, Verschuuren JJGM. "Myasthenia gravis." Nature Reviews Disease Primers . 2019;5:30.
- [2] Sussman J, Farrugia ME, Maddison P, Hill M, Leite MI, Hilton-Jones D. "Myasthenia gravis: Association of British Neurologists' management guidelines." Practical Neurology . 2015;15:199-206.
- [3] Merck Manual Professional Edition. "Myasthenia Gravis." Diagnosis section covering antibody, electrodiagnostic, ice-pack, and edrophonium testing.
- [4] US Food and Drug Administration. Tensilon (edrophonium chloride injection) prescribing information . Warnings, adverse reactions, and diagnostic testing information.
- [5] Narayanaswami P, Sanders DB, Wolfe G, and colleagues. "International Consensus Guidance for Management of Myasthenia Gravis: 2020 Update." Neurology . 2021;96(3):114-122.