CONDITION

Lambert-eaton myasthenic syndrome

Lambert-Eaton myasthenic syndrome is an autoimmune condition that weakens communication between nerves and muscles.

WHAT IT IS
Autoimmune condition disrupting nerve-to-muscle signals

BODY SYSTEM
Nervous system and muscles

MAIN SYMPTOMS
Leg weakness, dry mouth, reduced reflexes, trouble climbing stairs

WHAT CAUSES IT
Immune attack, sometimes linked to lung cancer

HOW IT IS DIAGNOSED
Nerve stimulation tests and calcium-channel antibody testing

MAIN TREATMENT
Symptom medicines, immune treatment, and cancer treatment when needed

CAN IT BE CURED?
Sometimes - cancer treatment can bring remission

IS IT AN EMERGENCY?
Sometimes - breathing or swallowing becomes difficult

LONG-TERM OUTLOOK
Often manageable; associated cancer strongly shapes outlook

Overview

Lambert-Eaton myasthenic syndrome, or LEMS, is a rare autoimmune condition affecting communication between nerves and muscles. It is also called Eaton-Lambert syndrome.

Normally, a nerve releases a chemical called acetylcholine when it needs a muscle to move. In LEMS, the immune system mistakenly attacks calcium channels on nerve endings. These channels help release acetylcholine. When too little is released, muscles do not receive a strong enough signal.

LEMS mainly causes weakness in muscles close to the centre of the body, especially the hips and thighs. It can also affect automatic body functions, causing symptoms such as dry mouth and constipation.

In some people, LEMS is associated with cancer, most often small-cell lung cancer. LEMS symptoms may appear before the cancer is found. This does not mean that everyone with LEMS has cancer, but appropriate cancer screening is an important part of assessment and follow-up.

Symptoms

Symptoms often develop gradually over weeks or months. Weakness usually starts in the legs and may later affect the shoulders, arms, neck, swallowing muscles, or breathing muscles.

Common symptoms include:

Muscle strength may briefly improve after a few movements. For example, standing may become easier after repeatedly tightening the leg muscles. This improvement is usually short-lived, and longer activity can still lead to fatigue.

Drooping eyelids and double vision can occur, but eye symptoms are often less prominent than in myasthenia gravis, another condition affecting nerve-to-muscle communication.

Trouble swallowing, slurred speech, and breathing weakness are less common but need prompt attention.

- Weak hips and thighs, making it difficult to climb stairs or rise from a chair
- An unusual or waddling walk
- Aching muscles, tiredness, or reduced stamina
- Dry mouth, constipation, blurred vision, or reduced sweating
- Erectile dysfunction
- Reduced or absent reflexes

Causes and risk factors

LEMS is caused by an immune-system error. Most people with the condition have antibodies against P/Q-type voltage-gated calcium channels. Antibodies are proteins that normally help defend against infection. In LEMS, they interfere with the release of acetylcholine from nerve endings.

There are two main clinical settings.

Cancer-associated LEMS develops when an immune response to cancer cells also attacks calcium channels on nerves. It is most strongly linked to small-cell lung cancer. A history of

smoking raises the risk of this cancer, although not everyone with cancer-associated LEMS has smoked.

LEMS without an identified cancer is also autoimmune. People in this group may have another autoimmune condition, but often there is no clear reason why the immune reaction began.

LEMS is not usually inherited. Having the condition does not mean that a child or close relative will develop it.

Diagnosis

No single symptom confirms LEMS. Diagnosis is based on your symptoms, an examination, electrical nerve tests, and antibody testing.

During an examination, a clinician may check muscle strength and reflexes. Reflexes that are initially weak may briefly improve after you contract a muscle.

Electrodiagnostic testing measures the electrical response of muscles and nerves. During repetitive nerve stimulation, a nerve is stimulated several times while the muscle response is recorded. In LEMS, the response is often small at rest but increases substantially after brief exercise or rapid stimulation. This pattern helps confirm a problem at the point where nerves meet muscles.

A blood test can look for antibodies against voltage-gated calcium channels. A positive result supports the diagnosis, but it must be interpreted with the symptoms and electrical test results. Some people with LEMS do not have detectable antibodies.

Because LEMS may be associated with lung cancer, testing commonly includes chest imaging. If the first assessment does not find cancer, further screening may be advised. The timing and type of follow-up are based on factors such as age, smoking history, symptoms, and previous scan results.

Other conditions, including myasthenia gravis, muscle disorders, nerve disorders, medication effects, and thyroid problems, may cause similar weakness.

Treatment and management

Treatment aims to improve nerve-to-muscle signalling, control the immune response, and treat any associated cancer.

Amifampridine is a medicine used to improve acetylcholine release from nerve endings. It can increase strength and mobility, although it does not remove the underlying immune cause. It

requires medical supervision because side effects and seizure risk must be considered.

Pyridostigmine slows the breakdown of acetylcholine. It may provide additional benefit for some people, but it is often less effective in LEMS than it is in myasthenia gravis.

If symptoms remain limiting, immune treatments may be considered. These include medicines that suppress immune activity. Intravenous immunoglobulin, or IVIG, provides purified antibodies through a vein and may give temporary improvement. Plasma exchange, which removes antibodies from the blood, is sometimes used for severe symptoms or when a faster response is needed.

When LEMS is associated with cancer, cancer treatment is central to care. Successful treatment may also improve muscle weakness, although this is not guaranteed.

Physical or occupational therapy can help with safe movement, pacing, and practical changes at home. Walking aids may reduce falls when leg weakness is significant.

Some medicines can worsen nerve-to-muscle transmission. Before starting a new prescription, non-prescription medicine, or supplement, make sure the prescriber or pharmacist knows that you have LEMS. Do not stop an existing medicine suddenly without medical advice. Tell an anaesthesia team about LEMS before surgery or sedation.

Complications

Weak legs can lead to falls, injuries, and reduced independence. Swallowing weakness may cause choking or allow food and liquid to enter the lungs, which is called aspiration.

Severe breathing weakness is uncommon, but it can become an emergency. Reduced movement may also contribute to muscle loss and physical deconditioning.

Immune-suppressing treatments can increase the risk of infection and cause other side effects. Regular monitoring helps balance these risks against the benefits of treatment.

When cancer is present, the long-term outlook is strongly influenced by the type, stage, and response to cancer treatment.

Prevention

There is no proven way to prevent autoimmune LEMS.

Not smoking, or stopping smoking, lowers the risk of small-cell lung cancer and many other health problems. It cannot guarantee that LEMS will be prevented or change LEMS that has already developed.

Cancer screening after a LEMS diagnosis does not prevent the condition, but it may help find an associated cancer earlier.

Living with it and what to expect

LEMS often continues for years, but its course is not the same for everyone. Symptoms may improve with treatment, remain stable, or fluctuate. Some people continue to have weakness or fatigue even when treatment is helping.

LEMS without cancer is usually managed as a long-term autoimmune condition. Treatment may need adjustment if symptoms change or side effects develop. Routine neurology appointments may include strength testing, review of daily activities, blood tests, and discussion of treatment effects.

When LEMS is linked to cancer, muscle symptoms may improve if the cancer responds to treatment. The overall course then depends greatly on the cancer.

Many people remain active, but they may need to pace demanding tasks. Rest breaks, handrails, a raised chair, and avoiding very hot environments may make daily activities easier. Gentle, supervised activity can help preserve fitness without pushing through marked weakness.

New weakness does not always mean that LEMS is progressing. Infection, poor sleep, medication changes, and other health problems can temporarily make symptoms worse. Report a sustained change at routine or prompt follow-up rather than changing treatment yourself.

When to get medical help

Arrange a medical appointment if you develop gradually worsening leg weakness, repeated difficulty rising from a chair, unexplained dry mouth with weakness, or new problems with balance. These symptoms have many possible causes and need assessment rather than self-diagnosis.

If you already have LEMS, contact your care team promptly for:

Seek emergency help for severe or rapidly worsening breathlessness, inability to swallow saliva, repeated choking, a very weak cough, or bluish or grey lips or skin. These can indicate serious breathing or swallowing weakness.

Routine changes in stamina or mild symptom fluctuations can usually be discussed at

scheduled follow-up, unless they are worsening quickly or affecting breathing or swallowing.

- A clear or lasting decline in strength
- New choking, coughing during meals, or changes in speech
- Repeated falls
- New cough, unexplained weight loss, or ongoing chest symptoms
- Possible treatment side effects or signs of infection

Common questions

Is Lambert-Eaton syndrome a type of cancer?

No. LEMS is an autoimmune condition, not a cancer. However, it can be triggered by an immune response to small-cell lung cancer. This is why cancer screening is part of the assessment, even when there are no obvious cancer symptoms.

Can Lambert-Eaton syndrome go away?

Symptoms may improve greatly with treatment. If LEMS is associated with cancer, treating the cancer can sometimes bring remission. LEMS without cancer is more often a long-term condition that needs ongoing management. A complete and permanent cure cannot be promised.

What is the difference between LEMS and myasthenia gravis?

Both affect communication between nerves and muscles. LEMS interferes with the nerve's release of acetylcholine, while myasthenia gravis usually affects the muscle's ability to receive it. LEMS often begins with leg weakness and dry mouth. Myasthenia gravis more often begins with drooping eyelids or double vision.

Does exercise help LEMS?

Brief muscle use can temporarily improve strength, but prolonged effort may cause fatigue. A tailored activity plan can help maintain mobility and fitness. Exercise should be paced, particularly if you have significant weakness, falls, heart or lung problems, or active cancer treatment.

Can I drive with LEMS?

Driving safety depends on how weakness, double vision, fatigue, and treatment side effects affect you. You may need to notify the relevant driver-licensing authority or vehicle insurer. Do not drive if you cannot reliably control the pedals, turn the steering wheel, see clearly, or react quickly.

Will my children inherit LEMS?

LEMS is not usually inherited in a direct way. Children and close relatives do not routinely develop it because another family member has the condition.

Sources

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