

Limb-girdle muscular dystrophy 1B (LGMD 1B)

LGMD 1B (also known as Laminopathy)

LGMD 1B is an autosomal dominant form of limb-girdle muscular dystrophy (LGMD). The age of onset of muscle weakness is variable; the most common presentation is before 20 years, however some people may present with symptoms when they are older.

What causes it?

LGMD 1B is caused by a fault in the Lamin A/C gene, which gives instructions to produce a protein important to the muscle fibres. Faults in the Lamin A/C gene also cause autosomal dominant Emery-Dreifuss muscular dystrophy, an isolated cardiomyopathy, an autosomal recessive peripheral neuropathy (Charcot–Marie–Tooth disorder type 2B1) and an unusual condition called Lipodystrophy.

How is it diagnosed?

The diagnosis can be suspected by findings on a muscle biopsy or when a doctor experienced in muscular dystrophy examines you. A serum creatine kinase (CK) blood test is often within the normal range or mildly elevated.

Unusually, in a few cases, CK elevation may be much more marked.

The diagnosis has to be confirmed by identifying the faulty gene (Lamin A/C gene) which is done on a DNA sample from a blood test. This is often done following a clue from the muscle biopsy or examination.

What symptoms are common?

People with LGMD1B often have initial symptoms of weakness and wasting (loss of muscle bulk) in the hip, thigh and shoulder muscles. This weakness is usually even on both sides of the body and leg involvement is present before shoulder and arms. This can result in frequent falls, difficulty in running, climbing stairs and rising from the floor. As the condition progresses, people can have problems with walking. Shoulder and arm weakness can lead to difficulties in raising the arms over the head and shoulder blade winging may be present (scapular winging).

As the condition progresses, the distal muscles (hand and forearm muscles in upper limbs and ankle and calf muscles in the lower limbs) can also be involved. People may experience difficulty in doing simple tasks due to hand weakness (for example opening bottles) and in walking due to foot weakness (foot drop) which causes them to stumble frequently.

Some people complain of muscle pain, especially in the legs. Less often, calf hypertrophy (large calves) may be present. As the condition progresses, people may develop joint contractures (tightening) in the arms (elbows) and legs (ankles). Facial and neck muscles are not usually involved. However some people may show mild facial weakness, with difficulties in inflating their cheeks, whistling and experience fatigue in chewing.

People with LGMD1B are at risk of heart problems. These heart problems can be mild to severe even when weakness is not impacting on a person's daily activities. Problems with the heart can begin at the onset of weakness and tend to increase with time.

The heart involvement in LGMD1B usually consists of rhythm and conduction disturbances and less frequently dilated cardiomyopathy. People with heart problems can experience symptoms of breathlessness, tiredness or palpitation (funny beats). However, some people can have heart problems even when they do not show symptoms.

Less frequently, people with LGMD1B may develop respiratory muscle weakness and experience breathing difficulties with the progression of the condition. Breathing symptoms can include; poor sleep, nightmares, tiredness or headaches after waking up in the morning, lack of appetite and falling asleep during the day.

What are the implications of the diagnosis?

Inheritance

LGMD1B is an autosomal dominant condition caused by a change in a gene. People affected with this condition have 1 faulty copy of the Lamin A/C gene inherited from one parent. This means that usually the parent who carries the same faulty gene is also affected but may not be aware of this because their symptoms may be very mild. However, the change in the Lamin A/C gene could have begun for the first time ("new fault" or "new mutation").

People affected by LGMD1B have 50-50 chance of passing on the faulty gene and the condition to their children (of either sex). Prenatal diagnostic testing is available and this can be discussed with your consultant or geneticist in more detail.

Progression and complications

LGMD1B is quite a variable condition in terms of severity and the weakness, but usually the progression is slow to moderate and people remain ambulant. Life expectancy depends upon the identification and treatment of the associated involvement of the heart and the breathing muscles.

Treatment and management

So far there are no specific treatments for LGMD1B, however managing the symptoms of the condition improves a person's quality of life. Keeping mobile is important for all people affected with muscular dystrophy. There are not any guidelines about the type or intensity of activities, however it is recommended that advice on exercise should be discussed with your consultant because of the associated heart problems.

Joint contractures (tightening) or foot drop can occur in LGMD1B and therefore regular physiotherapy is recommended. This can be carried out by a physiotherapist or people can be taught to do this by themselves in their own home. An orthopaedic opinion may be indicated and orthoses (splints) are sometimes worn to enhance good positioning of the ankle joints or help with foot drop if there is weakness in the feet.

Because of the risk of problems with the heart in LGMD1B, regular heart checks are required and these should include ECG and Echocardiogram. Many treatments are available and affected people are likely to need the insertion of a device (defibrillator) which controls the heart rate. This will be discussed with you by a cardiologist.

With progression of the muscle weakness, people with LGMD1B may develop breathing difficulties. Therefore, regular monitoring of respiratory function (FVC) is recommended. Sometimes overnight studies are indicated (Pulse Oximetry).

Other relevant factsheets from the Muscular Dystrophy Campaign:
The Limb Girdle Muscular Dystrophies (LGMD)

MC16

Published: 11/07

Updated: 04/08

Written by the National Commissioning Group (NCG) and the Clinical team at Newcastle upon Tyne:

Professor K.M.D. Bushby MD FRCP, Professor of Neuromuscular Genetics

Professor V. Straub MD, Professor of Neuromuscular Genetics,

Professor H. Lochmuller MD, Professor of Experimental Myology

Dr M. Eagle, Consultant Physiotherapist

Dr M. Guglieri MD, Clinical Research Fellow,

L. Hastings, Principal Genetic Counsellor

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