

Weakness is a broad term which can have a variety of meanings. It may be used to refer to generalised fatigue or malaise; or it may be more specifically muscle weakness.

People with arachnoiditis often suffer from fatigue (76% in the 1999 survey).

They also frequently have muscle weakness, which can be mild, moderate or severe. 82% of the 1999 Survey respondents reported weakness as a symptom.

Although occasionally, patients may have a myopathy* (muscle disease), usually in arachnoiditis the cause is related to spinal nerve roots being damaged.

* this tends to present with limb girdle weakness and tenderness in the involved muscles

Terminology:

Paresis: muscle weakness but not paralysis (hemiparesis= one side of the body;

paraparesis=in the legs)

Plegia: paralysis (hemiplegia= paralysis in one arm and leg;

paraplegia= paralysis in both legs; quadriplegia= paralysis in all 4 limbs)

Upper motor neuron syndrome: nerve pathways from the spinal cord to the brain (corticospinal) are damaged and below the spinal level of damage there is weakness, spasticity and increased reflexes

Lower motor neuron syndrome(LMN): dysfunction at the spinal level or peripherally, affecting the anterior horn cell, nerve root, peripheral nerve or neuromuscular junction. (nerve-muscle relay) This causes weakness, decreased reflexes and loss of muscle tone (floppy). There may also be muscle wasting(atrophy) and distinct fasciculations (twitches).

Radiculopathy: nerve root damage

In arachnoiditis, there may well be nerve root damage, at one or several spinal levels. Weakness will tend to occur in the same areas as pain sensation.

The commonest areas are in the foot and calf. Also buttock muscles may be affected, with muscle wasting. If there is cervical (neck) pathology, then spasticity may be evident. This can also arise when there is damage to the corticospinal tracts.

NB sudden onset of weakness should be assessed by medical personnel.

Other Causes:

Disuse atrophy

Muscle wasting may be due to disuse. If pain restricts mobility, and impedes normal function, then often the reduced movement causes the muscle to atrophy (waste) which, of course, in turn renders the affected limb even less mobile.

Disuse or immobilisation can affect the healthiest of individuals (young people with a broken bone can get a slight muscle wasting in the area of the plaster cast).

In the chronically ill, the risk of this is higher.

Potassium abnormality:

Either high (hyperkalaemia) or low (hypokalaemia) potassium can cause muscle weakness.

Causes of hyperkalaemia include:

- Hyperkalemic familial periodic paralysis (a rare inherited disorder)
- Digitalis intoxication
- Beta adrenergic blockade (beta blocker drugs)
- Decreased excretion: Chronic or acute renal failure
- Systemic lupus erythematosus
- Renal allograft
- Sickle cell disease
- Increased input: Salt substitutes (and Potassium penicillin)

Hypokalaemia causes muscle weakness and even paralysis.

Low blood potassium seems to occur in a number of people with arachnoiditis, but it is not specific to this condition as it also occurs in other people with chronic illness.

Causes include:

- Poor dietary intake: Tea and toast diet; excessive alcohol intake
- Gastrointestinal loss: Protracted vomiting/ diarrhoea; laxative abuse

- Excessive sweating
- Excess mineralocorticoid effect: Primary or secondary hyperaldosteronism
- Excessive glucocorticoid hormones (Cushing's syndrome); Excessive ACTH (endocrine disorders)*
- Licorice abuse
- Renal tubular acidosis (a kidney disorder)
- Diuretic therapy (water tablets)
- Carbenicillin, penicillin therapy
- Leukaemias

Hyperthyroidism: potassium levels are low in patients with hyperthyroidism, muscular weakness is proportionate to potassium deficiency, and correction of thyroid hormone levels results in correction of potassium levels.([\[1\]](#))

*note that in chronic pain conditions, the stress involved may lead to a sustained increase in stress hormones, of which cortisol (a glucocorticoid) is one.

A further, uncommon, cause of weakness is autoimmune myasthenia gravis, a neuromuscular condition.

ABNORMAL POSTURE

Stooped posture may arise from paraspinal muscle weakness. This can occur in conditions such as paraspinal myopathy ('bent spine' syndrome) and myasthenia gravis.

Limb girdle weakness (shoulder, pelvis) obviously affects posture.

Spine disorders such as ankylosing spondylitis (with which arachnoiditis may be associated) tend to cause a stiff spine and thus inability to bend.

Tests for weakness:

Clinical examination will assess the patient's ability to move the limbs, including against resistance.

Stance and gait will also be assessed to determine any abnormalities. Tests include electromyography (EMG) and the Tensilon test (to test for neuromuscular transmission).

Treatment:

This basically comes down to physiotherapy. It is vital to maintain mobility if at all possible.

As Neville Shone wrote in his book, "Coping Successfully with Pain",,

"Beware rest does not turn into rust."

Note that arachnoiditis is an inflammatory condition and should be approached in a similar fashion to conditions such as rheumatoid arthritis (care must be taken not to trigger a 'flare-up').

However, it is vital to maintain the highest mobility possible within the confines of your individual physical condition, in order to reduce a domino effect of musculoskeletal problems and of course, osteoporosis which can result from immobility.

In addition, loss of mobility can be very damaging to morale.

"Use it or lose it";

is unfortunately a very true adage: lack of exercise leads to loss of muscle strength and it takes at least 10 times as long to replace as it does to lose it. Prevention is certainly the most effective way to tackle weakness.

For those who are unfortunately already wheelchair bound, you still need to exercise as much as is appropriate for your circumstances. You may need increased upper body strength in order to facilitate transfer to and from your chair; and if you maintain it, you should also be able to retain some degree of independence.

EASY DOES IT!

Do remember, it is not a question of

?No pain, no gain'.

Gentle exercise such as in a hydrotherapy pool may be beneficial; little and often is the best strategy.

Little and often and only very gradual increases where possible. Overdoing things will only set you back.

LOSING HEART?

Dealing with loss of function due to weakness can be very demoralising, especially if you had accustomed yourself to a certain level of function and have recently lost ground, perhaps due to

what seemed a minor incident at the time (a slight fall, or a minor car accident can sometimes trigger a rapid deterioration).

In a 'flare up', you may experience worsening of your weakness. Again, this can be extremely worrying.

The thing to remember is that arachnoiditis does fluctuate, there are good days and bad days. Short periods of worse symptoms may well be short-lived.

Should the loss of function persist, one of the prime sources for concern is loss of independence. It is vital that you seek expert help to get your level of function properly assessed in order to gain access to any necessary aids to activities that you might require (including modifications for driving).

[1] Edmonds CJ; Smith T Rev Neurol 1999 Sep 16-30;29(6):510-2 Total body potassium in relation to thyroid hormones and hyperthyroidism.