PEMFS REVERSE THE MUSCLE DAMAGE FROM CHOLESTEROL LOWERING DRUGS (STATINS)

STATIN DRUG USE

One in four Americans, ages 45 and older or almost 32 million take a statin. Statins are used to lower cholesterol into what are considered to be optimal ranges. Cholesterol is a fundamental molecule made by the body for many health maintaining purposes, including helping to fight infection, reducing cancer rates, producing coenzyme Q 10, vitamin D, the sex hormones and the body's own natural cortisone. Life can't exist without cholesterol. About 80% of the cholesterol in our blood is made by the body. If you eat only 200 to 300 milligrams (mg) of cholesterol a day (one egg yolk has about 200 mg), your liver will make an additional 800 mg per day from raw materials such as fat, sugars, and proteins. When less is taken in, the body simply makes more.

Modern medicine considers cholesterol a problem, primarily related to the possibility of it causing cardiovascular disease. It is associated with cardiovascular disease but many believe that it is not the cause. The late modern medicine deals with high cholesterol is to reduce it by using statin lowering agents. The use of statins is not innocuous. Most doctors prescribe them like candy, not really being convinced that there are significant problems with their use.

PROBLEMS CAUSED BY STATINS

However, there are significant health issues from taking these drugs. 7% to 29% of patients are reported to develop muscle complaints while receiving statin treatment. These muscle issues can show up in a high percentage of people as simply weakness, without any pain or discomfort. Complaints are often made worse by exercise. Statins have been shown to reduce mitochondrial oxidative capacity and content in human muscle and impair mitochondrial adaptations needed in muscle during muscle activity. This issue of the statins causing weakening of muscles, is especially important as we try to have everyone increase their activity and exercise levels, to maintain health and longevity. This means that people on statins are less likely to be as active or exercise as much as they should be doing. And, most people tend to follow their doctors' advice and take the statin medicine as prescribed.

MUSCLE PROBLEMS CAUSED BY STATINS

Few studies have examined the effects of statins on muscle contraction function and exercise performance, and even fewer studies have examined this in statin users with muscle complaints. For example, the Effect of Statins on Skeletal Muscle Function and Performance (STOMP) trial is, to our knowledge, the only randomized, double-blind clinical trial that has examined aerobic exercise performance and muscle strength before and after treatment with placebo or high-dose atorvastatin (STOMP) (Parker). STOMP researchers found that more patients in the atorvastatin group than in the placebo group developed muscle complaints. However, this study only recruited individuals who had never taken statins. So, the absence of damaging changes in muscle function and performance would not apply to those who were already statin users, and especially not those with symptoms.

STATIN MUSCLE DAMAGE STUDY

An optimized study was done to further assess the damage caused to muscles by statins. (Allard) This study not only assessed people who had been long-term statin users but also did bicycling tests, involuntary electrically stimulated isometric quadriceps-muscle contractions, and muscle biopsies. The study checked for maximal exercise capacity, use of muscle fuel during exercise, muscle function, and mitochondrial energy metabolism. They checked the results of statin users who are symptomatic and those who weren't. These individuals are compared to control individuals who were not on statins.

At the end of the study, they found that symptomatic statin users had ~28% lower muscle ATP production capacity than control individuals. Symptomatic statin users had 69% of the ATP of the controls and asymptomatic statin users had 81%. ATP production capacity was lowest in the symptomatic group of statin users and highest in control subjects. Oxidation rates, mitochondrial respiration and mitochondrial density measurements were significantly lower in symptomatic statin users. Mitochondrial density, in turn, was directly related to exercise capacity, VO2peak. Therefore, they found statin-induced changes in muscle fuel use during maximal exercise performance, muscle fatigue during repeated muscle contractions, and disturbances in the mitochondrial oxidative capacity of the muscle. When participants were exposed to multiple contractions typical of exercise to assess fatiguing of the muscle, statin users clearly showed increased fatiguing than control individuals. In addition, statins impact calcium balance in the muscles which can also contribute to cramps and muscle pain.

The mitochondrial energy generating capacity of the asymptomatic statin users was reduced even compared to healthy people. Statin users had increased lactic acid production at a lower level of their maximal capacity and symptomatic statin users also had higher lactate levels late in exercise. More muscle energy was required in asymptomatic statin users at rest and this extra demand was still present in people with muscle damage after stopping statin therapy.

PEMF EFFECTS ON MUSCLE

PEMFs are known to enhance muscle function. They do this through a number of mechanisms, including nerve stimulation, mainly by increasing energy supply in the muscle, improving circulation, reducing swelling in the muscles after activity, stimulating stem cell production, and probably other actions as well. This means that PEMFs can be very effective for reducing and limiting the muscle damage caused by statins in the very large proportion of the population who are using these drugs. For various reasons, people who are taking these drugs may not be able to stop them, following doctors' orders. At the very least, they can increase their activity and ability to exercise, while still taking their statins. Since there is evidence that the damage to muscles goes on long after the medication is stopped, PEMFs can be continued until muscles have repaired. Beyond this, of course, one can get all the other benefits of PEMFs for the various health issues that people have, including slowing aging.

WHAT IS THE EVIDENCE FOR PEMFS HELPING MUSCLES?

1. Muscle soreness is a common result of muscle exercise, even in those not on statins. Delayed muscle soreness after exercise has been shown to be improved by PEMFs. (Jeon)
2. One of the most basic actions of PEMFs is on adenosine, which forms adenosine triphosphate (ATP). PEMF stimulation of body tissues increases the energy production of ATP. Because of this PEMFs allow muscles to work longer, harder and recover faster. See more on this molecule at this link. Since statins block ATP production in muscles, PEMF can reverse this problem.
3. High intensity PEMFs used outside under the pelvis have been found to reduce urinary incontinence in women by strengthening pelvic muscles. (Bakar) The PEMF induces controlled activation of nerves in the stimulation area and hence muscle contractions. As a result, PEMFs directly stimulate pelvic floor muscles and sacral roots.
4. Also, high intensity PEMFs can generate very powerful muscle contractions with much less discomfort than electrical stimulation. (Han; Gorodnichev)
5. There is even evidence that magnetic fields can accelerate the development of new muscle cells. (Surma; Eldashev; De Carlo)

WHICH PEMFS WOULD WORK BEST?

Since the effect of statins is on all the muscles in the body and felt most in the skeletal muscles being used during activity, any kind of PEMF may help, but whole body PEMFs, which cover a majority of the body muscles may be the most beneficial. Otherwise, small area PEMFs may still be able to help with smaller areas which may be affected most. Higher intensity PEMFs would work the best. Frequency is not likely to be that important, since most frequencies between 5-75 Hz will increase ATP.

References

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