SAMe

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S-adenosyl-L-methionine (SAMe) is a natural molecule synthesized from the amino acid methionine in the presence of magnesium and adenosine triphosphate (ATP). The SAMe molecule is a carrier of methyl groups, and provides a sulfur molecule as well. The liver is a site of methylation and sulfation reactions necessary for detoxification, and can use SAMe to assist in these processes. As a matter of fact, SAMe supplementation has proven beneficial in chronic liver disease, and in the prevention of cirrhosis and fatty liver, the consequences of chronic liver disease. SAMe has also been studied in fibromyalgia and osteoarthritis, and appears to offer benefit to these disorders. Furthermore, in the brain SAMe is necessary for methylation of neurotransmitters, and appears to provide a benefit similar to common antidepressant drugs.

Liver health

As stated above, SAMe has contributions to make to liver health. For example, SAMe is necessary for the production of glutathione, the primary antioxidant found in the liver.[1] In addition, SAMe has been found to be effective in the treatment of cholestasis—a condition in the liver characterized when bile flow is impaired. In one study patients with cholestasis were given 1600 mg daily of oral SAMe, resulting in a significant reduction in certain serum markers of cholestasis.[2] SAMe may also have applications in liver cancer, a disease which is often the result of depletion of methylation reactions and consequent cirrhosis or fatty liver. Research on rats provides evidence of an inhibitory effect of SAMe on tumor growth in the liver.[3] It is suggested that this benefit occurs at the cellular level.[4 5]

Fibromyalgia

Fibromayalgia is a rheumatic disorder characterized by generalized musculoskeletal pain, stiffness, fatigue, insomnia, the presence of trigger points, and the absence of changes in laboratory measures of rheumatic disease.[6] It is also recognized that many patients with fibromyalgia suffer from depression. A study of 17 fibromyalgia patients revealed a significant improvement in both pain at trigger points and depression following SAMe treatment.[7] In another study, 34 fibromyalgia patients receiving SAMe experienced improvement in pain and overall well being, but these improvements were not statistically significant.[8]

Osteoarthritis

Although SAMe provides benefit to patients with osteoarthritis, its mechanism of action is unknown. It is speculated that it improves cartilage repair, or that it may act as an anti-

inflammatory agent. In any case, when osteoarthritis patients were given intravenous SAMe (400 mg for 5 days) followed by oral SAMe (200 mg three times daily), they experienced a statistically significant reduction in pain. The benefit was noticed as soon as 14 days after the beginning of SAMe therapy.[9] When compared to the same dose of ibuprofen (1200 mg daily), four weeks of SAMe therapy resulted in similar improvement in the reduction of pain, morning stiffness, crepitus (cracking of the joints), swelling, and range of motion.[10] Other studies have confirmed these results.[11]

Depression

As noted in the above discussion about fibromyalgia, SAMe has been shown to be beneficial in those suffering from depression. This makes sense when considering that a disruption in the methylation process (a process in which SAMe is involved) may be involved in the development of depression. In addition, SAMe appears to raise levels of dopamine, an important neurotransmitter in mood regulation.[12]

A study of 15 patients suffering from severe depression revealed a benefit following SAMe supplementation.[13] Another study of 18 patients with major depression compared the efficacy of intravenous SAMe to oral imipramine. A clinically significant improvement in depressive symptoms occurred in 66% of SAMe-treated patients compared with 22% of imipramine-treated patients after two weeks. Other studies have shown similar results comparing SAMe to similar antidepressant medications. As a matter of fact, a meta-analysis of the studies on SAMe compared its' benefits relative to placebo or tricyclic therapy in patients with depression. The results demonstrated a greater response rate with SAMe.[14]

Other SAMe considerations

In their July 5, 1999 issue, Newsweek has published another article promoting the wonders of SAMe. In the same article, the author states, "And because SAMe is absorbed mainly through the intestine, it's best taken in enteric-coated tablets that pass through the stomach intact." Furthermore, the article states that of the two forms of SAMe available—tosylate and butanedisulfonate—the newer butanedisulfonate form of SAMe is more stable, and is only offered by a couple of companies—although "several U.S retailers import reliable tosylate products."

Does all this mean that SAMe products that are not enteric-coated and use the tosylate form are inferior? Don't you believe it!

<u>The truth about enteric-coating and SAMe</u>

First of all, just because SAMe is absorbed in the intestines doesn't mean that it must be enteric-coated. After all, virtually all vitamins and minerals are absorbed in the intestines, and yet they don't have to be enteric-coated in order to be absorbed. As a matter of fact, a Medline search did not indicate that enteric-coating was used in any study conducted on SAMe—and yet the SAMe was still able to be absorbed and utilized effectively enough to produce the myriad of positive results reported. Clearly this would not be possible if SAMe had to be enteric-coated.

The real reason that some manufacturers' enteric-coat SAMe is for stability. You see, SAMe is a very hydroscopic substance—that is, it has an affinity for water, and will readily break down with minimal exposure to moisture. As a matter of fact, SAMe is so hydroscopic that if you place a small amount of the raw material on your finger, the SAMe will turn into liquid within seconds. This creates a challenge for manufacturers who wish to produce supplements of SAMe. One method that can be used to stabilize SAMe is enteric-coating. This is not really the best method, however, for a couple of reasons. The first is that the enteric-coating is on the outside of the tablet, and if the tablet is damaged, it is no longer effective. The other reason is that the interpretation of federal manufacturing regulations allow

enteric-coating to be used on drugs, not on dietary supplements.

Tosylate vs. butanedisulfonate

Is the butanedisulfonate form of SAMe really better than the tosylate form? Actually a medline search reveals nine studies where the tosylate form of SAMe produced positive results.[15 16 17 18 19 20 21 22 23] By contrast, the only study where the butanedisulfonate form was mentioned indicated that this form had "no effect."[24] Consequently, even if the butanedisulfonate form is more stable, so what? If it has no effect, who cares?

Conclusion

SAMe is a natural compound with good research on its applications for liver health, fibromyalgia, osteoarthritis and depression. As a dietary supplement, it should be seriously considered by those individuals who stand to benefit most from its value.

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