

## Tuesday Minute Transcript

This Week's Topic

# Stearic Acid... Toxic or Tame?



**"A closer look at the study used to claim that supplements containing stearic acid (or magnesium stearate) are toxic."**

As clinicians, whether it's protocol or products, we want to have our facts straight. It's wise to know the latest research, stay up to date on literature, and to discern the credibility of our sources. For example, we have heard from various nutrient manufactures that the use of magnesium stearate can cause suppression of T-cells and may lead to impaired membrane integrity. More recently, a few clinicians have stated that magnesium stearate or stearic acid can encourage the creation of biofilms.

Biofilms are an accumulation or breeding ground of microorganisms where bacteria, viruses, fungi, and/or protozoa are embedded in a polysaccharide matrix and attach to either solid biological or non-living surfaces. Biofilms are an important field of study as it appears the most resistant bacteria or fungal strains can exist in these pockets.

So every clinician needs to ask, are these claims based on science or opinion? It's



unfortunate, but also it is necessary to ask: Are these claims designed to add a marketing advantage to the companies who promote their validity?

Lest I leave you hanging, let me give you the short version. Magnesium stearate and stearic acid have not been shown to inhibit immune suppression in any human trials. Stearic acid has been shown to actually reduce the incidence of biofilms.

What is stearic acid, and how prevalent is it? Stearic acid is one of the most common of the long-chained

fatty acids. It is an 18 carbon saturated fat and is found in significant amounts in meat, poultry, fish, eggs, butter, grains, and milk products.

Just to give you an idea, chocolate contains cocoa butter which is high in saturated fat. About a third of the fat in chocolate is in the form of stearic acid. A person who eats a chocolate bar will ingest hundreds of times more stearic acid than someone taking a dietary supplement with magnesium stearate.

Magnesium stearate is a salt containing two parts

stearate and one part magnesium. Our bodies make magnesium stearate naturally in our digestive tracts. Magnesium which has a positive charge, frequently attracts stearate, which is a negatively charged ion. But let's look into why someone would say "that stearic acid has been reported to suppress the action of T-cells."

The Journal of Immunology published an article by Tebbey and Buttke in 1990. "In vitro" is Latin for glass. In this "in vitro" study, it was demonstrated that T-cells are lacking enzymes which precludes them from desaturating or breaking down stearic acid. They postulated that feeding T-cells large amounts of stearic acid may lead to impaired membrane integrity. Furthermore a large feeding of stearic acid to T-cells can lead to a loss of membrane potential and loss of cell function and viability.

Let's look closer at this study which has been used to make the claim that stearic acid is toxic and supplements that contain stearic acid and/or magnesium stearate are, therefore, toxic. Most people are not trained in toxicology. Toxicology is a field of science that explores the relationship of effects caused by various doses of ingredients to cell and organ function. The "in vitro" or what I call the test tube method of testing allows the incorporation of very large doses of substances that may not represent the "in vivo" or living condition.

For example, every dietary mineral can be shown to be toxic by "in vitro" analysis. A scientist can increase potassium to 1000 times its normal amount in cell function by "in vitro" testing and report the toxic effects of potassium. Anyone using an "in vitro" potassium report could claim that "this dietary supplement contains potassium which has been shown to be toxic." Even the general observer knows that too much of any substance or mineral will normally cause an imbalance in any living system.

Let's consider biofilms for minute. Certain molecules called autoinducer-2 (or AI-2)

are used by microorganisms to modulate biofilm formation among other activities. Here's a study that shows stearic acid in high doses actually hinders biofilm development. The Journal of Food Protection in 2008 published an article "Identification of Ground Beef-Derived Fatty Acid Inhibitors of Autoinducer-2-Based Cell Signaling." "Gas chromatographic analysis revealed the presence of several fatty acids such as palmitic acid, stearic acid, oleic acid, and linoleic acid were capable of inhibiting AI-2 activity."

Of course, these fatty acids were tested at different concentrations high to low to identify differences in the level of AI-2 activity inhibition. Inhibition ranged from 25 to 90%. Small amounts of stearic acid or magnesium stearate may not inhibit biofilms but certainly will not contribute to their growth.

So getting back to the supplement industry, just how much stearic acid are we talking about? The amount of stearic acid or magnesium stearate in a tablet is generally no more than 0.5%. This means that a single 1000 mg tablet would supply 5 mg of stearic acid. In comparison, one soft gel of flax seed oil supplies 14 mg of stearic acid. Stearic acid occurs naturally in flax seeds and many plant oils. Most manufacturers select a vegetable source grade, generally palm oil of stearic acid.

I have included the references for the negative "in vitro" source below as well as some positive effects of stearic acid.

I hope this discussion will help you discriminate some of the marketing hype for your own personal health selections and help you discuss these issues with your clients. It's nice to have answers like this on hand before questions come up. It's my opinion that magnesium stearate used appropriately is safe; and once you look closely, I'll think you'll agree.

Thanks for reading this week's edition. I'll see you next Tuesday.