The Omega-3 Pill That Worked (And Made Millions)

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Corrections: An earlier version of this article stated that Amarin had developed an Omega-3 ***supplement****; rather, theirs, Vascepa, is a highly-purified, FDA-approved Omega-3* ***medication****.*

Dietary supplements get a bad rap, and with good reason: they are not clinically proven, they are not FDA approved and they seldom work. omega-3 is one of the many such pills that Americans have taken for decades without supporting evidence-- which is why physicians were dumbfounded when an omega-3 drug was found to significantly reduce the risk of heart attack.

In fact, the manufacturer of the omega-3 pill tested, Amarin, saw its stock soar over 500% following the announcement. Its market cap rose from less than one billion to over five in mere days. Even prior to the study, in 2017, the omega-3 drug had a product revenue of $180 million.

The drug, Vascepa, differs from most omega-3 dietary supplements in that its key component, EPA, is in a highly purified state, while supplements usually contain a mixture of EPA, DHA and other components. Vascepa is different enough from existing omega-3 formulations that the FDA has classified it as a "new chemical entity," thus protecting it from competitors.

Is fish oil a miracle drug, how does it work, and why had previous studies all found it to be ineffective?

Cod Liver Oil Capsules pictured with a Cods Liver (Getty Images)

Is Something Here Fishy?

Despite the market confidence, the results of this trial, called REDUCE-IT, do not mean that everyone should go out to buy fish oil supplements. The study *did* find that for those with a history of heart disease and type II diabetes, and significantly elevated triglyceride levels, the drug could reduce their risk of heart attacks by 25% (when partnered with the normally-prescribed statin).

In fact, previous research seemed to demonstrate pretty conclusively that omega-3 is *not* effective at preventing heart attacks (or cancer, stroke, etc. for that matter) in the general population. The Amarin trial was so surprisingly successful because it targeted an extremely ill and high-risk group, and as an experimental study, it ensured that the participants took a high dose of the purified omega-3 component daily.

Despite the caveats, for those with a history of heart disease and diabetes, this finding could be life-saving. And considering heart disease is still the number one killer in the developed world, and up to 80% of those deaths are preventable, tens of millions of lives could benefit from these results.

So how does Omega-3 actually work?

The Lesser of Two Evils

Omega-3 on its own is not a miracle drug. It is beneficial solely in contrast to its close cousin, omega-6. Both are converted in the body into eicosanoids, a special class of lipids (fats) which promote inflammation. While inflammation is a normal function in response to injury, too much can be life-threatening-- inflammation is a precursor of cancer and a catalyst for the buildup of plaques that cause heart disease.

Atherosclerosis-- fatty build up (in yellow) and inflammation (in pink) nearly block the entire coronary artery, making it impossible for red blood cells to pass through and deliver oxygen where it is needed. This blockage can lead to heart attack or stroke. (Getty Images)

Fortunately, omega-3 is converted into eicosanoids (the inflammatory molecules) a lot slower than omega-6. Both compete to be converted, so someone who eats a high ratio of omega-3 to omega-6 ends up with, in theory, less inflammation throughout the body. In this way, omega-3 is not actually "anti-inflammatory," but simply the lesser of two inflammatory evils.

A Healthy Oil

Omega-3 is a polyunsaturated fish oil, meaning that its contains multiple double-bonds (in contrast to the unhealthy, saturated fats from meat which do not contains these bonds). Omega-3 is one of many oils that the human body cannot synthesize on its own and must derive from diet, thus making it, by definition, a vitamin.

It makes perfect sense that humans would not be able to synthesize all of the molecules we use-- after all, different kinds of omega-3s are found in plants and chicken eggs, along with marine life, meaning that anyone with a balanced diet would consume enough of them.

Of course, nowadays, few individuals in the developed world consume a balanced diet. Processed foods replace unsaturated fats, like Omega-3, with saturated and trans fats, which are cheaper and less likely to spoil.

Moreover, remember that the amount of omega-3 is important as a ratio to its "evil" twin omega-6. Some believe that as hunters and gatherers, humans ate a diet with a roughly one-to-one ratio of the two. Today's agriculturalist diet has as much as thirty times more omega-6, which exacerbates inflammation and may even lead to obesity. And it's not only grains and bread that pose a problem-- grain-fed meat has far more omega-6 than grass-fed. Fish and leafy vegetables, on the other hand, can help replace omega-6 with omega-3

The richness of omega-3 and similar nutrients in marine life may help explain why Japan, which largely subsists on fish, has the highest life-expectancies of all major countries. In fact, studies find that those that eat fish at least twice, weekly, get all the benefits of Omega-3 supplements.

To Take Or Not To Take?

Ultimately, the best thing that the average person can learn from the results of the omega-3 study is that, as a society, we must change our approach to food. Supplements and even drug like this one cannot be absorbed as well as nutrients found in natural products.

Those with a history of heart disease, diabetes, and high cholesterol should talk to their heart doctor about omega-3 (along with Vitamin E to help absorption). The rest of us would be better served eating grass-fed, leaner meats and more fish, nuts and vegetables.

As a medical student and award-winning researcher with a background in genetics and anthropology, I tell the story of, by and for our species. Understanding our ancient origins and molecular instructions enables us to safeguard our bodies and treasure our frail yet miraculou...