

Health Scout News

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For years, scientists have known that eating such oily fish as salmon, tuna or bluefish regularly could prevent sudden cardiac death.

The reason for that may just have become clearer.

According to new research appearing in the June 3 issue of *Circulation*, fatty acids in this type of fish are stored in individual heart cells and serve to prevent irregular heart rhythms (also known as arrhythmias) by working through the heart's calcium and sodium channels.

Sudden cardiac death causes at least 250,000 deaths each year in the United States alone, says the American Heart Association (AHA). As its name implies, this type of death occurs unexpectedly and in people who may or may not have diagnosed heart disease. Most cardiac arrests occur as a result of life-threatening arrhythmias.

The body requires two types of polyunsaturated fatty acids (PUFAs) in order to function: n-6 and n-3. Both must come from the diet, because the body does not produce them. Since 2000, AHA dietary guidelines have recommended that healthy adults eat at least two servings a week, especially fish high in omega-3 fatty acids, such as mackerel, lake trout, herring, sardines, albacore tuna and salmon.

The first study to show a benefit to the heart from n-3 PUFAs was in 1989. Since then, a number of additional studies have also shown beneficial effects, but no one knew what the specific mechanisms at work were.

For this study, the researchers removed the hearts from several one- to two-day-old rat pups, then separated and cultured the cells and placed them under a microscope for observation. By the second day, the heart cells had clump together and were beating spontaneously, rhythmically, and simultaneously -- just like a whole heart would.

The video camera taped the heart cells as different agents were applied, including PUFAs. "The heartbeat itself is due to electrical activity which, in turn, results from small ions -- sodium, calcium, and potassium -- moving through specific ion channels in the cell membrane of heart cells. These channels recognize the specific ions," says Dr. Alexander Leaf, lead author of the study. Leaf is a professor emeritus of clinical medicine at Harvard Medical School and former chief of medicine at Massachusetts General Hospital, both in Boston.

When a person has a heart attack, the cells in the area that is no longer receiving blood tend to die. There remain a few cells in the peripheral area between the dead cells and the remaining normal heart muscle, which become "mischief makers," Leaf says. "They are much more ready to shoot off an electrical signal that causes a contraction of the heart,

and they do this out of the normal electrical cycle that produces the regular rhythm of the heartbeat," he says. "It can produce arrhythmia."

The fatty acids eliminate the mischief makers by blocking excessive sodium and calcium currents in the channels of the heart. "By modulating these two ion channels, they preserve the normal electrical activity of the heart," Leaf explains. And the benefit takes place very quickly. "The effect comes on very soon if one starts eating these fatty acids regularly," Leaf says. "It takes just a small amount."

Leaf recommends fresh or frozen fish, but says that canned tuna will suffice if it is water-packed. He also advises sticking with the AHA's recommendations of having at least two meals of oily fish per week. "That certainly will protect most people cardiac death, [but] about 20 percent of the American public doesn't eat any fish oil at all," he says. Anyone with a family or personal history of coronary heart disease should talk to his doctor about a supplement.

While saying the research is interesting, other experts call for prospective, randomized studies in humans.

"I do not think what they've said is very conclusive. There is no prospective, double-blind study that shows the efficacy in the prevention of sudden death," says Dr. J. Anthony Gomes, professor of medicine and director of cardiac electrophysiology and electrocardiography at the Mount Sinai School of Medicine in New York City.

Gomes also says that drugs that work on sodium and calcium channels aren't always the answer. "They do not necessarily prevent sudden cardiac death," he says. "That's why we went to defibrillators."

But fish does deserve extra attention, he admits.

"It might be something very interesting and very useful," Gomes says. "After all, it is something one can eat. It may even be pleasurable."