

Arthritis care: Beyond tea and sympathy

It sounds like a dessert request, but a pot of tea and bowl of cherries may prove a prescription for defusing painful over-reactions by the immune system.

Two research teams have stumbled across natural products—green tea and tart cherries—that may be useful in controlling inflammation from injury or diseases such as arthritis. These foods contain antioxidants that inhibit the Cox-2 enzyme, which the body employs to fire up this inflammation.

In one of the new studies, Tariq M. Haqqi and his colleagues at Case Western Reserve University in Cleveland isolated compounds known as polyphenols from green tea and added them to the drinking water given to young mice. Later, the researchers injected some of these animals with a substance that triggers immune reactions mimicking rheumatoid arthritis. They also injected animals that continued to receive unadulterated drinking water.

Within about a month, 94 percent of the mice drinking untreated water developed redness or swelling, usually in at least two paws. The affected paws often proved too painful to walk on. Though 44 percent of the mice drinking treated water also developed symptoms, theirs were far milder, showed up later, and typically affected just one paw, Haqqi's team reports in the April 13 *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*.

Probes of the affected joints turned up virtually no cartilage damage in the mice consuming polyphenols but significant damage in the plain-water drinkers. The joints of these control animals also had far higher concentrations of immune-system cells and the inflammation-triggering compounds that they produce, such as Cox-2 and TNF-alpha.

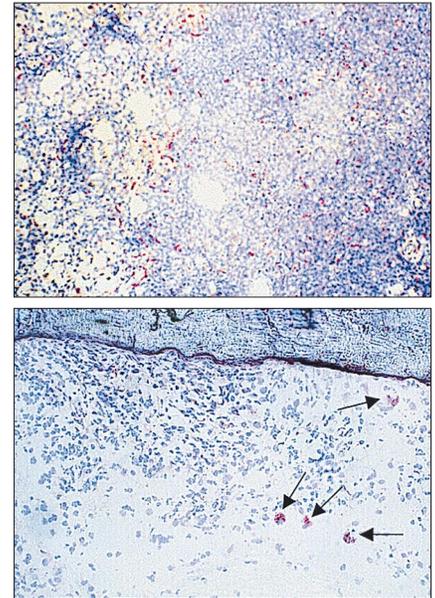
Haqqi was so surprised by these findings that he repeated the experiments twice more to quell his disbelief. Now he's working to identify which of the polyphenols are most protective.

Even though 80 percent of the world's tea drinkers down black tea, Haqqi is focusing on green tea because its composition is simpler. Black tea has the same polyphenols, albeit in smaller quantities, he says.

The other natural compounds recently shown to have anti-inflammatory activity are antioxidant pigments extracted from tart cherries. Chemist Muraleedharan G. Nair and his coworkers at Michigan State University in East Lansing say that eating 20 tart cherries per day might provide a natural alternative to aspirin.

Drugs such as aspirin inhibit the activity of Cox-2 and that of a related Cox-1 enzyme. Nair says his studies, reported in the February *JOURNAL OF NATURAL PRODUCTS*, indicate that the cherry compounds are not only some 10 times as potent as aspirin in inhibiting Cox-2 and Cox-1, "but also remain active longer."

Unfortunately, he adds, tart cherries are much more sour than cranberries. If the cherry pigments prove clinically beneficial, he says, people may want to get them from a pill. "Cooking destroys much of the [inflammation-fighting] stuff in the fruit," he explains, so a slice of pie won't substitute. Nobody has yet investigated whether sweet cherry pigments would have an



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Cells producing TNF-alpha, an immune-system compound active in arthritis, are stained red. Five times as many of these cells have infiltrated the joint of a mouse drinking plain water (top) as tissue from a tea-polyphenol drinker (bottom; arrows point to TNF-alpha cells).

anti-inflammatory benefit.

Both studies involve “good science,” says Brian Butcher, vice president for research at the Atlanta-based Arthritis Foundation. Because the tea study observed an effect in animals, he believes that work—which his organization partially funded—provokes “a degree of excitement.” However, he says, people with arthritis should not substitute green tea for the medications that their doctors have recommended.

—*J. Raloff*