Podcast: The Pros and Cons of Turmeric Transcript

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Turmeric Evidence Overview

Doesn't it seem like when it comes to nutrition, there are more opinions than facts to go around? Every day we hear new [music] theories about diets and supplements and best foods to eat. Well, my role is to take the mystery out of good nutrition and look at the science. Welcome to episode 500 of the NutritionFacts podcast. In our first story, we look at dozens of human trials that reveal where turmeric delivers and where it doesn't. With [music] our former senior research scientist, Dr. Kristine Dennis.

The number of clinical trials on turmeric, not in rats or petri dishes, but with actual people, continues to climb, dozens a year. And most were randomized double-blind placebo-controlled, the gold standard for clinical trials.

There have been so many trials published that there are now umbrella reviews on turmeric. You've heard of systematic reviews and meta-analyses, pooling multiple studies together.

Well, an umbrella review can be like a systematic review and meta-analysis of systematic reviews and meta-analyses, meaning pooling multiple meta-analyses together, placing them at the very top of the hierarchy of evidence pyramid.

Dr. Greger has covered the benefits of the turmeric pigment curcumin for knee osteoarthritis, in some cases working as well as or even better than anti-inflammatory drugs and painkillers, without their side effects of injuring our gut. And in the 10 years since, a meta-analysis of 11 meta-analyses on the efficacy of curcumin for relieving osteoarthritis strongly supports that it can relieve pain as well as improve joint mobility and shorten medication use.

And more isn't necessarily better. Low-dose extracts appear to have similar pain relief effects to high-dose extracts. What about other arthritic conditions? A pilot study in 2012 of 45 patients showed promise for rheumatoid arthritis, finding it is actually more effective at alleviating pain compared to the leading drug.

And a recent meta-analysis including more than 500 patients found the same. Curcumin was beneficial both for inflammation levels and clinical symptoms. Curcumin's ability to lower some inflammatory biomarkers like C-reactive protein, a marker of systemic inflammation, extends more broadly to patients with auto-inflammatory conditions, and the stronger effects seem to appear at relatively smaller doses. You may recall that Dr. Greger talked about a 2012 study in pre-diabetic individuals, where 0% of those taking curcumin extract for 9 months progressed to type 2 diabetes, while 16% of those on placebo did. There have been a lot of studies since.

14 systematic reviews and meta-analyses containing 61 individual randomized controlled trials were included in this umbrella review.

Turmeric for Blood Sugar, Cholesterol, and Weight

Fasting blood sugars and HbA1c, a measure of longer-term blood sugar control, both improved, no matter what formulation of turmeric or curcumin was consumed. But, the quality of the studies was low, not including important information like their funding sources.

And the types of turmeric curcumin preparations were wide-ranging. What if we want to know the impact of turmeric alone, not a special curcumin formulation that supplement companies can charge us a bunch of money for?

This dose-response meta-analysis breaks it out for us, with turmeric resulting in better results than curcumin-only treatments. Note the benefit was found for a variety of participants, not only those with diabetes. What about cholesterol? Here's another umbrella review. Although the authors concluded that curcumin could have ameliorating effects, there was only a half-point drop in LDL. Lower doses may work better, but a two-point drop is still nothing to write home about.

Turmeric curcumin blocks obesity in mice fed a high-fat diet. What about people? In an umbrella review of 50 randomized controlled trials, curcumin supplementation significantly decreased BMI, body weight, and waist circumference.

It was significant statistically, but how much of a difference did it really make? A loss of about a half kilogram or a little more than a pound of body weight. Waist circumference, a measure of abdominal obesity, decreased by about a centimeter, and triple the effect in trials with whole turmeric relative to curcumin extracts.

So, for those with obesity or type 2 diabetes and wanting to lose weight, the primary prescription is lifestyle modification. And some turmeric on the side might be helpful, but may not make that much difference. In our next story, we look at what happens when turmeric is put to the test to reverse DNA damage caused by arsenic exposure. Arsenic is a carcinogenic heavy metal, and the major mechanism of arsenic-related damage appears to be oxidative stress. It's the arsenic-induced accumulation of free radicals that can kill off cells and damage our DNA.

And then the double whammy is that it may disrupt our body's ability to repair our DNA once it's damaged. Well, if the damage is oxidation, what about eating an antioxidant-rich food such as the spice turmeric, which contains an antioxidant pigment known as curcumin?

As anyone familiar with my videos can attest, numerous clinical trials have suggested therapeutic efficacy against a variety of human diseases including cancer, diabetes, Alzheimer's, and inflammatory bowel, joint, lung, skin, and eye diseases. In terms of protection against heavy metals, they suggest turmeric may both help scavenge free radicals as well as chelate or bind up heavy metals. But, it's all just theory until you put it to the test.

Turmeric Against Arsenic DNA Damage

Unfortunately, until recently, the tests were like where you can see if curcumin can protect against heavy metal-induced oxidation in pureed rat brains. Why can't you just give some turmeric to people? It's not like there aren't millions of people out there who've been exposed to arsenic and could use some help.

In what became the greatest chemical disaster in human history, so-called tube wells were installed in Bangladesh to provide clean water. UNICEF meant well. Too bad they didn't test the water for arsenic. As many as one in 10 in some parts of the country will now go on to die from cancers caused by the arsenic exposure.

This allowed the medical community to document all sorts of interesting cancers, but why not give them something that may help like turmeric curcumin? After determining the extent of DNA damage, 50% of volunteers were randomly selected and prescribed curcumin capsules blended with little black pepper compound, and the other half were given a placebo. Now, they wanted to establish a baseline in the arsenic-exposed group, so they waited for 3 months to start the study.

And indeed, the DNA damage remained stable. Then for 3 months, they proceeded to give them the curcumin or the placebo. The placebo didn't do much, but within the first month, you could see the curcumin working. And by the third month, the DNA damage in the curcumin-treated arsenic group was no worse than those who hadn't been exposed to arsenic at all. That's amazing. The curcumin had an effective role in the regression of DNA damage. Yes, it's an excellent antioxidant agent, but what they found subsequently is that the curcumin undid the arsenic crippling of our DNA repair enzymes. So, both help prevent the damage and facilitate repair. Thus, curcumin may be a useful modality for the prevention of arsenic-induced cancer development.

Of course, you have to make sure the turmeric itself isn't contaminated with heavy metals. All those poor kids in Bangladesh. It's not one thing, it's another, and it's not just kids in Bangladesh. Nearly a quarter of spices purchased in Boston had lead in them.

It's not just a matter of buying US versus foreign brands, as the lead levels were not found to be statistically significantly different. How about just eating antioxidant-rich fruits and vegetables?

The reason we care about DNA damage is that we care about cancer. What if you measured the beta-carotene levels in people exposed to arsenic who went on to develop cancer compared to those who got exposed to the same amount of arsenic, but didn't get cancer? Beta-carotene is like a proxy for healthy fruit and vegetable intake. The way you get high levels in your blood is you eat lots of healthy foods like greens and sweet potatoes.

Compared to those with low levels, those with high [snorts] levels of beta-carotene in their blood had 99% lower odds of getting arsenic-induced cancer, 100 times lower odds. So, if you're going to eat rice, why not some rice with some sweet potatoes on top? Finally today, an unsettling number of cases linking turmeric extract curcumin supplements to liver injury.

Liver injury associated with turmeric, 10 cases from the drug-induced liver injury network in the United States. And there are others, too, including three cases reported in Australia and a series reported to the Italian Ministry of Health. Is turmeric really a new hepatotoxic substance? First of all, regardless of what the titles of the papers say, these cases appear to be from turmeric extract supplements rather than turmeric the spice. It's like green tea and green tea extract pills. Brewed green tea appears to be completely safe for the liver, but give people green tea extract supplements, and the livers of as many as one in 17 people becomes inflamed. So, we should consume our green tea in beverage form, not pill form. And similarly, our turmeric in spice form at culinary doses, not capsules. Unless they contain just a single ingredient, whole spice turmeric, not curcumin, not an extract, no other ingredients. While turmeric extract supplements have a relatively safe side effect profile even at high doses, there is an increasing number of case reports linking them to liver injury, especially when combined with agents such as piperine, a compound found in black pepper.

As we've covered before, compounds like piperine are added to turmeric to enhance the bioavailability of curcumin, potentially contributing to its toxicity. As one reason curcumin may be so safe is that it's poorly absorbed.

Turmeric Safety, Liver Injury, and Contamination

As we have cautioned before, piperine blocks liver detox enzymes that can make some substances like curcumin more potent. And turmeric curcumin supplement formulations with high bioavailability, such as nano formulations or those with added piperine, have been less investigated. There's a mistaken assumption that if a little is good, then more must be better.

We'd never make that assumption for drugs, so why is it made for supplements? In this case, more does not necessarily mean better. A review of nearly a hundred randomized controlled trials of turmeric or curcumin supplements for non-alcoholic fatty liver disease found that they successfully calmed liver inflammation and guess which worked better. Low-dose supplements worked about 10 times better than high-dose ones. There are caveats though, even for whole food turmeric. As Dr. Greger has covered before, people who have a tendency to form kidney stones should be careful due to turmeric's relatively high oxalate content.

Dr. Greger recommends only a quarter teaspoon a day in his daily dozen. There's also been concern about lead contamination of the whole food spice. Lead chromate has been used to make turmeric appear more yellow in Bangladesh, where much of turmeric sold in the United States is imported from, leading to multiple recalls. The wonderful news is food safety policies can work. Since the original paper of lead chromate contamination in turmeric from Bangladesh, the portion of market turmeric samples with detectable lead went from about 50% to zero. Unfortunately, there is still more work to be done though. In four South Asian countries, where more than 80% of the world's turmeric is produced, 14% of samples had detectable lead above 2 micrograms per gram. For context, this is 20 times higher than the US Food and Drug Administration's maximum allowable level for lead in candy. And some stores sold turmeric containing much higher levels of lead that would result in projected blood lead levels in children up to 10 times higher than the US Centers for Disease Control's threshold for concern. This is a reminder that just because something is natural doesn't mean it can't cause harm. Turmeric dietary supplements are big business, estimated to account for $69 million in sales in the United States alone. Though it's popularity does help put the recent spate of liver toxicity cases in context. More than 10 million people in the United States take turmeric or curcumin supplements, so that would be like one case in a million. Some people may just be more susceptible genetically. Seven of the 10 patients in this case series had a genetic variant that's relatively rare in the general population.

Still, it's safer for everyone to use the real thing and not some extract in some supplement. And please don't let anyone inject turmeric or curcumin into your veins. Visit nutritionfacts.org/audio to see all the podcast episodes with descriptions that include links to the associated videos. Sources cited and other details are available on each video's page. Information about my books, How Not to Die, How Not to Diet, and [music] How Not to Age, is at nutritionfacts.org/books.

All proceeds, of which I get, are donated directly to charity. And I've got a new book in the publication pipeline, the manuscript for How Not to Hurt, my diet and lifestyle approaches to pain management. It's been handed in and will be published December 15th. >> [music] >> I'm going to be doing a series of webinars to feature some of the new research that I discovered. Sign up for our free newsletter at nutritionfacts.org/subscribe to stay updated on when those will be.

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