Turmeric and black pepper fight cancer stem cells

A new study shows that a combination of turmeric and piperine can limit the growth of stem cells for breast cancer -- the cells that conventional treatment have the hardest time eliminating.

My friend Madhuri Kakarala is a physician at the University of Michigan; she's a cancer specialist and a PhD researcher. But she's also a nutritionist, and, like me, during her final years of medical studies she was diagnosed with cancer -- a stage IV cancer of the thyroid. Madhuri decided to invest all her talent as a researcher and clinician in the task of getting well, and she rapidly arrived at the conclusion that nutritional change could significantly improve her response to her cancer treatment.

Because Madhuri is from an Indian background, she was most interested in the medical and culinary traditions of her country, and particularly fascinated by the promising effects of turmeric in the prevention and treatment of cancers.

This month Madhuri published an important article on the effect of turmeric on breast cancer stem cells. [1] Stem cells are at the center of a theory that seeks to explain why cancer can sometimes return, despite apparently effective treatment. This is because even when all the cancer cells have been eliminated, these cancer stem cells that have lied dormant and escaped treatments may be able to form entire new colonies of cancer cells. So to prevent relapse, it's essential that we learn how to eliminate the stem cells. But unfortunately, because they don't actively renew themselves through cell division like other cancer cells do, most existing treatments that target cancerous cells (like radiotherapy and chemotherapy) aren't effective against stem cells. For this reason, the pharmaceutical industry has a whole sector of research devoted to developing new therapies to target and destroy stem cells.

For several years now, Madhuri's lab at the University of Michigan has been studying the effect on breast cancer of curcumin -- one of the most active substances in turmeric -- and piperine, which is a substance active in black pepper. In her latest study she demonstrates that concentrations of curcumin and piperine which can be obtained through diet or from dietary supplements are capable of eliminating breast cancer stem cells, without causing any damage to the normal breast cells. In other words, this isn't a general toxic effect on cells, like conventional anti-cancer treatments have, but an ultra-selective impact on cancer stem cells alone.

"This shows that these compounds are not toxic to normal breast tissue," Madhuri says. "Women at high risk of breast cancer right now can choose to take the drugs
tamoxifen or raloxifene for prevention, but most women won’t take these drugs because there is too much toxicity. The concept that dietary compounds can help is attractive, and curcumin and piperine appear to have very low toxicity.”

The possible anti-cancer properties of curcumin and piperine have been the object of many other studies. But this study is the first to show that they may have a targeted effect on stem cells. Medications like tamoxifen or raloxifene only act against cancers that are sensitive to estrogen. If curcumin and piperine can target stem cells, they have the potential to be useful in many types of breast cancer, particularly those that aren’t estrogen-sensitive -- and these are often the most aggressive.

Madhuri’s study was performed on cell colonies in Petri dishes, in lab conditions. So we haven’t yet reached the stage of a clinical study that would establish guidelines for recommendations to take turmeric supplements at specific dosages for certain types of cancer. However, given that turmeric and pepper, taken as part of a normal diet, are practically never toxic in any way, it seems to me to be perfectly reasonable to recommend that all of us regularly consume a soupspoon of turmeric every day, with a pinch of pepper. You can use it in all your cooking, just like I’ve been doing for years.

CAUTION: Note that it is often safest to avoid turmeric during chemotherapy as well as a three days before and after the treatment. This is because it can – rarely, but it can – interfere with some chemotherapy treatments and reduce their benefits.

REFERENCE