Tomato nutrient may intercept cancer growth

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Dr Mridula Chopra

(Medical Xpress) -- A nutrient in cooked tomatoes has been shown in laboratory studies to slow the growth of or even kill prostate cancer cells.

Dr. Mridula Chopra and colleagues at the University of Portsmouth tested the effect of the nutrient lycopene on the simple mechanism through which cancer cells hijack a body's healthy blood supply in order to grow and spread.

They found lycopene – which is what gives tomatoes their red colour – intercepts cancer's ability to make the connections it needs to attach to a

healthy blood supply. The researchers, from the university's School of Pharmacy and Biomedical Sciences, are now calling for tests to check if the same reaction occurs in the human body.

Director of the research Dr. Chopra said: "This simple chemical reaction was shown to occur at lycopene concentrations that can easily be achieved by eating processed tomatoes."

The research is published in the *British Journal of Nutrition*.

Lycopene is present in all red fruits and vegetables, but its concentrations are highest in tomatoes and it becomes more readily available and biologically active when it comes from processed tomatoes with a small amount of cooking oil added.

Dr. Chopra said: "I stress that our tests were done in test tubes in a laboratory and more testing needs to be carried out to confirm our findings, but the laboratory evidence we have found is clear – it is possible to intercept the simple mechanism some cancer cells use to grow at concentrations that can be achieved by eating sufficient cooked tomatoes."

The research was part-funded by Heinz after the food manufacturer asked for more research to follow up earlier studies by the same researchers which showed a significant increase in lycopene levels in blood and semen samples after subjects ate 400g of processed tomatoes for two weeks.

Dr. Chopra and her colleagues Simone Elgass and Alan Cooper had a firm agreement they would publish their results irrespective of the outcome.

Cancer cells can remain dormant for years until their growth is triggered

through the secretion of chemicals which initiate the process of linking cancer cells with endothelial cells (healthy gatekeeper cells which line blood vessels) allowing the cancer cells to reach out and attach to the blood supply. In the laboratory experiments, lycopene was shown to disrupt this linking process without which cancer cells cannot grow.

All cancer cells use a similar mechanism (angiogenesis) to 'feed' upon a healthy blood supply, but the researchers emphasised the importance of this mechanism for prostate cancer because lycopene tends to accumulate in prostate tissues.

Dr. Chopra said: "The important thing is for sufficient lycopene to reach where it can matter. We know that in case of prostate tissues it gets there.

"We have tested this in the labs but we don't yet know if the same action will happen in the body. Individuals will vary in how much lycopene their bodies make available to fight cancer cell growth and the ability of lycopene to 'intercept' in this way in the body is likely to vary between tomato products – both processing and cooking with fat have previously been shown to make lycopene more effective biologically. The type of tomatoes which offer the most effective lycopene also differs and more tests need to be done to find the best breed of tomato for this purpose."

It was suggested in their previous research that smokers might have to consume more tomatoes than non-smokers in order to achieve the benefits of lycopene due to the presence of high oxidative stress in smokers.

Eleanor Barrie, senior science information officer at Cancer Research UK, said: "Some existing cancer drugs target the formation of new blood vessels, but more research is needed to show how they could be used to help cancer patients. This small study doesn't directly tell us if lycopene

has any effect against cancer, but research like this can help us to understand more about how the chemical affects blood vessel formation."

Provided by University of Portsmouth