

Keto diet can fight cancer but also poses risks, study finds

It can slow tumour growth, but can speed up syndrome that causes loss of muscle, fat

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A ketogenic diet can help slow the growth of cancer tumours, though it can also accelerate a wasting syndrome that causes the loss of skeletal muscle and fat, recent research has found.

But when such a diet is combined with the use of the steroid hormone dexamethasone, they can suppress tumour growth while delaying the wasting syndrome, known as cachexia.

The study was carried out by researchers from the Cancer Science Institute of Singapore (CSI Singapore) and Cold Spring Harbour Laboratory in New York.

Published in scientific journal *Cell Metabolism* in June, the study

notes that cancer cells are dependent on glucose.

One of the study's authors, Professor Ashok Venkitaraman, said the idea of pairing cancer drugs with a change in diet to aid in the treatment of cancer has been around for some time.

"It originates from the simple idea that cancers are very fast-growing, and therefore use up a lot of sugar, in particular, and other substances to get energy in order to enable them to grow," said the director of CSI Singapore, a research institute at the National University of Singapore.

It was theorised that it would be possible to starve cancers by depriving them of the nutrients that they need, he told *The Straits Times*.



Professor Ashok Venkitaraman, director of the Cancer Science Institute of Singapore, is one of the authors of a study which found that a ketogenic diet combined with the use of the steroid hormone dexamethasone can suppress cancer tumour growth while delaying the wasting syndrome known as cachexia.
PHOTO: CANCER SCIENCE INSTITUTE OF SINGAPORE

A ketogenic or keto diet, which is high in fat and low in carbohydrates, would starve tumours of the glucose they need.

The researchers' work built on an earlier study by Memorial Sloan Kettering Cancer Centre in New York which suggested that a keto diet, when combined with a certain class of cancer drugs, could enhance the efficacy of treatment.

However, the latest research – conducted on mice with pancreatic and colorectal cancer – showed that while such diets can slow cancer growth, they also accelerate cachexia, which is common among cancer patients.

Prof Venkitaraman said dietary modifications could also have a negative impact on other parts of the body.

The researchers learnt that a ke-

to diet could lead to hormonal imbalances, he said.

As the imbalance originated in the adrenal gland, providing steroids normally produced by the gland could help partially address the problem, he added.

The study showed that administering dexamethasone delayed the onset of cachexia and extended the lifespan of the mice.

Assistant Professor Tobias Janowitz – principal investigator at Cold Spring Harbour Laboratory and another of the study's authors – said mice with cancer are unable to produce enough corticosterone, a hormone which regulates the effect of a keto diet, and are thus unable to stop losing weight.

Prof Venkitaraman said: "Our research highlights that dietary interventions affect many organ sys-

tems beyond just cancer cells, leading to both deleterious and positive consequences."

"Further investigation is needed to fully understand the balance of benefits and risks associated with these dietary approaches," he added.

His team in Singapore is now looking at how changes in metabolism associated with diabetes can cause cancer.

Prof Venkitaraman noted that Type 2 diabetes is associated with certain types of cancer, such as breast and pancreatic cancer.

"My hope is that in the future, we will understand better how diets work, both for cancer treatment as well as to delay or prevent the onset of cancer," he said.

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