

Could diet modification make chemotherapy drugs more effective for patients with pancreatic cancer?

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The findings of a new study suggest that a ketogenic diet—which is low in carbohydrates and protein, but high in fat—helps to kill pancreatic

cancer cells when combined with a triple-drug therapy developed by the Translational Genomics Research Institute (TGen), an affiliate of City of Hope.

In laboratory experiments, the ketogenic diet decreased glucose (sugar) levels in the tumor, suggesting the diet helped starve the cancer. In addition, this diet elevated [ketone bodies](#) produced by the liver, which put additional stress on the [cancer cells](#). The study published in the journal *Med*.

By destabilizing the cancer cells, the ketogenic diet created a microenvironment in which the triple-drug therapy designed by TGen—a combination of gemcitabine, nab-paclitaxel and cisplatin—was more effective at knocking out the tumor, according to the study.

"By limiting glucose availability, the ketogenic diet may promote chemotherapy efficacy," said TGen Distinguished Professor Daniel D. Von Hoff, M.D., considered one of the nation's foremost authorities on pancreatic cancer. Dr. Von Hoff is one of the study authors and designers of the therapy.

In addition, the ketogenic diet was shown to have a favorable impact on antitumor immunity by inducing pro-inflammatory tumor gene expression, which further weakened the cancer.

Clinical trials at five locations

To test these laboratory findings, researchers initiated a clinical trial of up to 40 patients at five centers nationwide: HonorHealth in Scottsdale, USC in Los Angeles, Nuvance Health in Connecticut, Atlantic Health System in New Jersey, and South Texas Accelerated Research Therapeutics in San Antonio.

The clinical trial will test whether adding a ketogenic diet to the triple-drug therapy will increase overall survival in patients with pancreatic cancer. This clinical trial began in late 2020 and is anticipated to continue to accrue patients through June 2023. Patients will be randomly assigned to either receive the triple-drug regimen while on a standard diet, while the other half will receive a ketogenic diet and the triple-drug therapy. The dietary aspects of the study are being carefully monitored.

"Our laboratory experiments show that a [ketogenic diet](#) changes pancreatic cancer metabolism and its response to chemotherapy," said Haiyong Han, Ph.D., a Professor in TGen's Molecular Medicine Division, and one of the study authors and a designer of the study's experiments.

More information: Lifeng Yang et al, Ketogenic diet and chemotherapy combine to disrupt pancreatic cancer metabolism and growth, *Med* (2022). [DOI: 10.1016/j.medj.2021.12.008](https://doi.org/10.1016/j.medj.2021.12.008)

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