Medical Xpress

Study shows diet and exercise improve treatment outcomes for obese pediatric cancer patients

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Diet and exercise may improve treatment outcomes in pediatric cancer patients, according to a study at The University of Texas MD Anderson Children's Cancer Hospital.

The findings, published in the September 13 online issue of *Pediatrics Research*, also revealed that diet and exercise have strong potential to improve chemotherapy effectiveness and reduces the risk of late effects in pediatric cancer patients. This discovery propels the need for more work to determine how energy balance—a combination of diet and exercise—can be implemented effectively during treatment to manage or treat obesity.

The researchers reviewed 67 studies including 32 novel clinical trials in pediatric patients, and data from a variety of cohorts with pediatric patients diagnosed with different cancers, including patients with acute lymphoblastic leukemia (ALL), rhabdomyosarcoma and brain tumors. The cellular mechanisms by which energy balance impacts tumor growth was also highlighted.

The relationship between diet and exercise and its positive effects on treatment outcomes in obese cancer patients has sparked interest for quite some time, but for pediatric patients, the research has been limited. While healthy eating is encouraged during and after treatment, special diet interventions as part of treatment for pediatric patients are

uncommon. Additionally, when it comes to physical activity, clinicians are cautious about administering an exercise regimen in a cancer care setting.

"The purpose of the review was to delineate between obesity reduction as a goal for energy balance interventions versus simply changing diet or adding exercise," said Joya Chandra, Ph.D., associate professor of Pediatric Research and lead author on the study. "For example, our review confirmed modifying diet or adding moderate exercise can improve chemotherapy efficacy independent of weight loss."

Obesity, an epidemic and risk factor for several cancers, is on the rise in pediatric cancer patients, globally. According to Chandra, who is also the co-director of MD Anderson's Center for Energy Balance in Cancer Prevention and Survivorship, obese pediatric patients diagnosed with leukemia and bone cancers have a lower prognosis for survival. Research also indicated that obese patients have a higher rate of relapse and do not respond to treatment as well as other pediatric patients. The analysis also shows genetic predisposition to obesity will require a more targeted pathway for treatment.

Although research confirms a poor diet and sedentary lifestyle lead to obesity, additional research is needed to understand how diet and exercise affects tumors in different cancers. For example, physical activity is known to control BMI and obesity, and to improve quality of life, but choosing the right exercise protocol can be challenging. Currently there are no known clinical trials examining the effects of physical activity on treatment efficacy in pediatric patients.

Keri Schadler, Ph.D., assistant professor of Pediatric Research at MD Anderson, and co-author on the paper says there are many factors to consider when tailoring an exercise regimen including the type of tumor, patient health status, and frequency and duration of the exercise.

"Exercise during treatment is safe and improves physical fitness in patients," said Schadler. "We have several clinical trials underway including one testing exercise interventions in bone tumor patients."

The research team also is administering nutrition interventions and looking at weight trajectory in ALL patients. Ongoing studies evaluating diet and exercise interventions and their impact on chemotherapy efficacy, and long-term toxicity risk for leukemia, Ewing's sarcoma, and osteosarcoma are also underway.

"The results from our study gives credibility to the need for energy balance interventions in clinical settings to improve treatment outcomes for pediatric patients," said Eugenie Kleinerman, M.D., professor of Pediatrics, and the study's co-author.

More information: Keri L Schadler et al. Diet and exercise interventions for pediatric cancer patients during therapy: Tipping the scales for better outcomes, *Pediatric Research* (2017). DOI: 10.1038/pr.2017.225

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