Obesity problem starts early phase of therapy in children with acute lymphoblastic leukemia

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Children with pediatric acute lymphoblastic leukemia (ALL) gain weight during treatment, and researchers at St. Jude Children's Research Hospital have discovered that this problem starts during remission-induction treatment and suggests that early intervention should be considered.

Chemotherapy drugs to treat ALL contribute to myriad problems, one of which is an increased risk of becoming overweight or obese. And because patients are growing, therapy can also affect their height.

Researchers studied 372 children with ALL and reviewed changes in their body mass index (BMI), height and weight from diagnosis to five years off therapy. The scientists' findings show that obesity was prevalent—and height growth, especially in patients with identified risk factors (age ≥10 years at diagnosis, standard/high-risk status, white blood cell count ≥ 50×109/L at diagnosis, and positive central nervous system disease)—was compromised.

"Once we found these large increases in BMI over time, we then have to look at intervention," said first author Emily Browne, D.N.P, R.N., C.P.N.P., director of the Transition Oncology Program at St. Jude. "If we could intervene, when should we?"

The answer: As soon as possible.

"Over the whole population that was studied, we found statistically significant weight gain even during remission-induction therapy," said corresponding author Hiroto Inaba, M.D., Ph.D., member in the St. Jude Department of Oncology. "We saw a need for an intervention at that point."

To address weight gain, they strongly suggest early interventions. These interventions include parent and guardian education about proper diet and exercise, which encompass cutting down sugar intake and instituting some sort of baseline activity level. For the issue of height, the researchers recommend evaluating certain patients for growth hormone deficiency. The results of this study appeared October 16 in the scientific journal *Cancer*.

"When you look at the literature of childhood obesity prevention for the general population, there are interventions that could also help ALL patients," Browne said. "But we need to adapt those recommendations to take the cancer therapy into account."

Here's the problem: Medications like glucocorticoids stimulate fat production and appetite. In addition, cancer treatment can cause nausea, pain and fatigue. Therefore, many patients aren't eating healthfully or physically active during therapy. These factors can lead to the increased risk of obesity, which can result in substantial physical and psychosocial morbidity and can possibly complicate infections, high blood pressure, and bone health. Treatment also causes growth issues. Younger children may be able to overcome this issue because they still grow after therapy is completed, but older children may suffer more because they are at a later stage of development which is compromised with therapy.

"We want to create a multidisciplinary approach in working with patients and their parents, including meeting the family where they are and finding when they want to or are ready to make some changes," Inaba

said.

Evidence-based obesity-prevention guidelines recommend using motivational interviewing to work with the patient and family to establish goals for behavioral change, such as decreasing sugar-sweetened beverage consumption and decreasing screen time.

Inaba and Browne recommend using a team of oncologists, nurses, dietitians, physical therapists, psychologists and endocrinologists to intervene at the beginning of therapy to establish an appropriate diet and activity level the patient and family can maintain.

Further study is needed to address the height consequences of therapy.

"We are hoping new therapeutic options can decrease intensity of chemotherapy and keep normal tissues intact," Inaba said. "But until then, we're collaborating with multiple clinical departments to help ensure a good, quality cure and a good quality of life in survivorship."

More information: Emily K. Browne et al. Changes in body mass index, height, and weight in children during and after therapy for acute lymphoblastic leukemia, *Cancer* (2018). DOI: 10.1002/cncr.31736

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