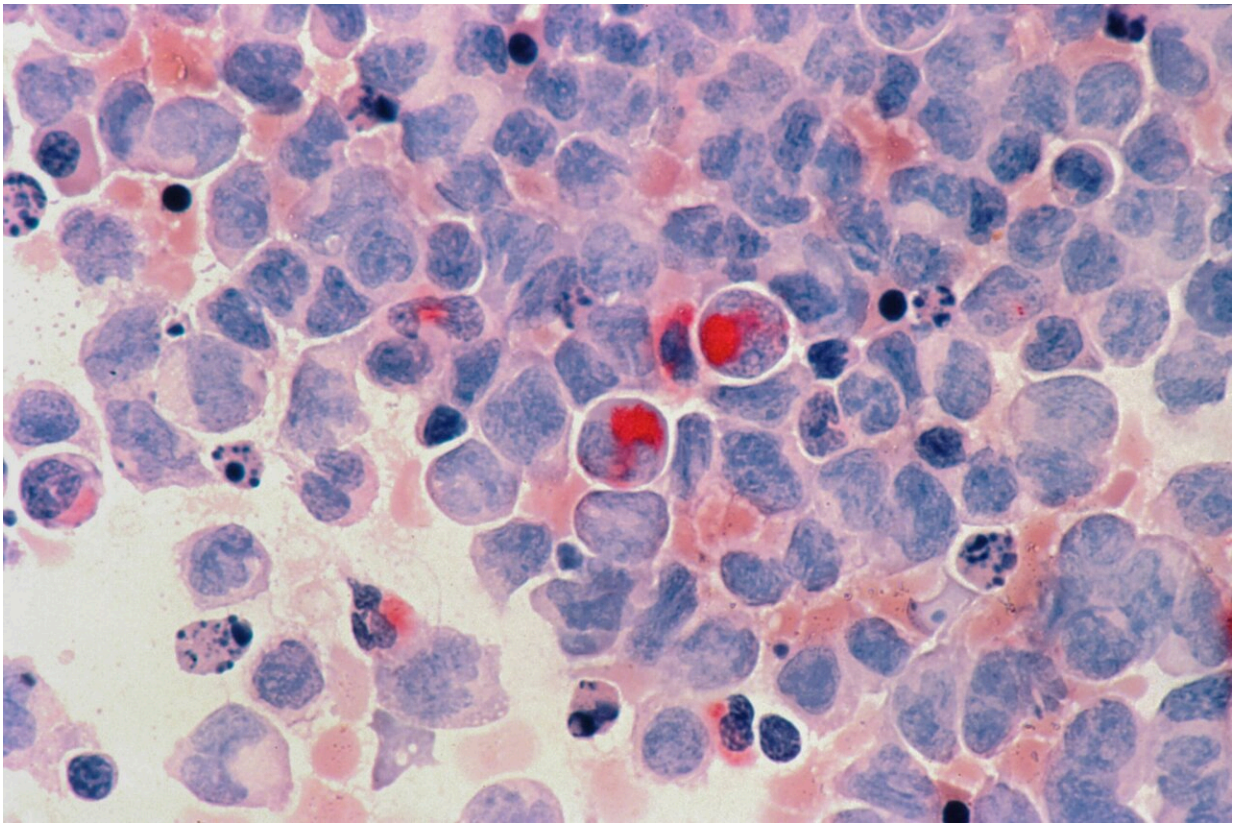
MedicalXpress

Obesity and high weight linked to adverse outcomes in leukemia treatment

July 13 2023



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As the United States faces a growing obesity epidemic, scientists are taking a closer look at how body weight can affect health outcomes. New research published in *Blood Advances* highlights the potential association

of elevated body mass index (BMI) with inferior outcomes to treatment for acute lymphoblastic leukemia (ALL) in adolescents and young adults (AYAs). This study sheds light on the impact of weight on treatment toxicities and outcomes and calls for further study of the impact of weight on response to different ALL chemotherapy regimens.

Obesity is a growing public health threat in the United States, affecting approximately 40% of the population as of 2020. The study's findings suggest that obesity, as defined by elevated BMI, may play an adverse role in AYAs' response to ALL treatment regimens.

"We have known for roughly fifteen years that obesity affects survival in pediatric patients treated for ALL, and more recently, we are recognizing a similar relationship in adult populations," explained Shai Shimony, MD, an advanced fellow at the Dana-Farber Cancer Institute and the corresponding study's lead author. "But we wanted more granular data on this, to understand why this correlation exists, and how dependent it is on age."

Investigators collected data from 388 AYAs aged 15-50 years, with a mean age of 24 years, who were being treated on Dana-Farber Consortium pediatric regimens for ALL from 2008 to 2021. The researchers examined the relationship between BMI, age, toxicities, and treatment outcomes in the cohort, aiming to identify any correlations or trends.

In total, 53.3% of AYAs included in the study had a normal BMI, while 46.6% were classified as overweight or obese. Notably, patients with an overweight or obese BMI exhibited a higher rate of non-relapse mortality (11.7% versus 2.8%) a lower event-free survival rate (63% versus 77% at 4 years), and a worse overall survival (64% versus 83%) compared to those with normal BMIs. It is important to note that the study found equivalent overall survival among younger (15-29) and older

(30-50) AYAs with normal BMI (83% versus 85%, respectively), which is an incredibly important finding, as age is often considered an adverse prognostic feature in ALL.

Interestingly, researchers found that the main factor driving worse outcomes among the entire cohort was non-relapse mortality, rather than disease relapse. Regarding toxicity, elevated liver enzymes and glucose levels were more frequent in patients who were considered overweight or obese (60.7% vs. 42.2%, and 36.4% vs. 24.4% respectively).

In the multivariable model for survival, higher BMI was associated with worse survival, while age was not associated with survival, and elevated triglycerides (fats in the bloodstream) were associated with improved survival. Elevated triglycerides reflect the activity of one of the principal chemotherapy medications (asparaginase) included in the regimen, and this finding suggests the possible use of this affordable lab test as a biomarker of treatment efficacy. However, the researchers note that this should not be viewed as an adverse finding.

"This study highlights the association between elevated BMI and increased treatment-related toxicity, non-relapse mortality, and decreased overall survival in AYAs undergoing treatment for ALL with intensive pediatric regimens," noted Dr. Shimony. Study authors Drs. Daniel DeAngelo and Marlise Luskin also highlight the effectiveness of the DFCI regimen in patients 18-50 years of age with normal BMI.

It is important to acknowledge the limitations of this study, including its retrospective nature, the absence of data on measurable residual disease outcomes, and the mostly white population. Additionally, the investigators stress that BMI, as well as other measures of obesity such as waist circumference, and waist-to-hip ratio, should be prospectively collected and correlated with outcomes in multiple treatment contexts, including patients of all ages and in the context of new regimens that

incorporate novel therapies.

"Moving forward, we hope that measures of obesity will be considered a vital variable in determining the most suitable treatment regimens for each individual patient," emphasized Dr. Shimony.

Provided by American Society of Hematology

Citation: Obesity and high weight linked to adverse outcomes in leukemia treatment (2023, July 13) retrieved 29 April 2024 from https://medicalxpress.com/news/2023-07-obesity-high-weight-linked-adverse.html