Polygenic score helps guide choice of chemo for pediatric acute myeloid leukemia

February 1 2022

(HealthDay)—A polygenic score derived from pharmacogenomic

evaluation of cytarabine (ara-C) pathway can help personalize treatment for pediatric patients with acute myeloid leukemia (AML), according to a study published online Jan. 18 in the *Journal of Clinical Oncology*.

Abdelrahman H. Elsayed, Ph.D., from the University of Florida in Gainesville, and colleagues analyzed single nucleotide polymorphisms (SNPs) in 166 patients from the multicenter-AML02 trial. The 10-SNP Ara-C_SNP score (ACS10) was developed via multi-SNP predictor modeling using the top SNPs predictive of minimal residual disease and event-free survival (EFS) from the AML02 cohort and four SNPs previously associated with ara-C triphosphate levels in a separate trial. In each clinical trial arm, ACS10 was evaluated for association with outcomes: the standard low-dose ara-C (LDAC, 91 patients) and augmented high-dose ara-C (HDAC, 75 patients) arms of AML02 and the standard Ara-C, daunorubicin, and etoposide (ADE) (465 patients) and the augmented ADE + gemtuzumab ozogamicin (GO; 466 patients) arms of the AAML0531 trial.

The researchers found that EFS and overall survival were significantly worse in the low- versus high-ACS10 group in the standard LDAC-arm of AML02 cohort (hazard ratios, 2.81 and 2.98, respectively). These results were validated in the standard-ADE arm of AAML0531, with worse outcomes observed in the low- versus high-ASC10 groups (hazard ratios, 1.35 and 1.64, respectively). EFS and overall survival did not differ between low- and high-ACS10 score groups within the augmented arms (AML02-HDAC and AAML0531-ADE + GO).

"Our comprehensive approach not only provides a unique ACS10 score of prognostic significance that can predict poor outcome in AML, but suggests that alternative treatment strategies with either high-dose ara-C or addition of GO are more suitable strategies for patients with detrimental low-ACS10 score," the authors write.

Several authors disclosed financial ties to the pharmaceutical industry; three authors disclosed pending patents related to the study subject matter.

More information: Abstract/Full Text (subscription or payment may be required)