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Human development index linked to stem cell transplant rates and success in leukemia patients

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The socioeconomic status of a country has long been considered a potentially significant factor in the availability of high-quality health-care interventions and even a determinant of long-term patient outcomes. A new study from the Acute Leukemia Working Party of the European Group for Blood and Marrow Transplantation reports that in Europe, socioeconomic factors have a direct correlation to the rates and outcomes of stem cell transplantation for patients with acute myeloid leukemia (AML).

This study was published online today in *Blood*, the official journal of the American Society of Hematology.

"Stem cell transplantation is an expensive procedure requiring well-equipped transplant units; advanced, long-term supportive care; and highly qualified medical and nursing staff, so it may be expected that access to these transplants as well as outcome of the procedure would depend on socioeconomic factors varying among and within countries," said lead study author Sebastian Giebel, MD, of the Department of Clinical and Experimental Oncology at the Comprehensive Cancer Center of the Maria Sklowdowska-Curie Memorial Institute in Gliwice, Poland.

In this study, a team of researchers led by Dr. Giebel evaluated the association of the Human Development Index (HDI) with rates and

outcomes (both short- and long-term) of AML patients treated with hematopoietic stem cell transplantation (HSCT). Using data on 16,403 patients from 30 European countries between 2001-2005, the team compared socioeconomic status with HSCT procedure rates. They then analyzed long-term outcomes (primarily leukemia-free survival, or LFS) related to HSCT for a sub-group of 2,015 AML patients who had received an HLA-matched allogeneic (using donor cells rather than one's own cells) HSCT.

The HDI is used by the United Nations to measure the socioeconomic status of countries across three basic categories: longevity (expressed as a life expectancy index, or LEI), knowledge (expressed as education index, or EI) and standard of living (measured by gross domestic product index, or GDPI). Based on the HDI, countries are considered to have a low, intermediate, or high development status. Most European states fall into the "high" category, but there are some variations so, for the purpose of this study, countries were categorized into five distinct HDI ranges.

Results of the study found that in Europe, the HDI was associated with both rates and results of HSCT for acute leukemia, with the strongest association related to the few countries in the highest HDI group (eight countries). With regard to rates of HSCT procedures, the team found significant correlations between HDI and total HSCTs performed for AML patients. The strongest associations were found between transplant rates and scores related specifically to LEI and GDPI, suggesting that not only purely economic conditions, but also the organization of the health-care and educational systems likely translate into availability of HSCT.

With regard to patient outcomes, transplants performed in countries in the highest HDI group were associated with significantly higher LFS (68%), which resulted mainly from reduced risk of relapse, as compared with the other four HDI groups (56%, 59%, 63%, and 58%, respectively,

in order of increasing HDI score).

"We believe there is still room for improvement in most European states to reach the outcomes achieved by the highest-HDI states, and identifying the factors that contribute to these differences is critical," said Dr. Giebel. "Our study was retrospective in nature, so we would encourage further prospective studies with detailed patient and procedural characteristics to help understand the true differences and design interventions to improve outcomes worldwide."

Previous studies have demonstrated some association of socioeconomic status (SES) with access to HSCT and mortality after transplantation in other parts of the world, but the association had not previously been studied across Europe, where diversity of SES may be less pronounced and most countries are considered well-developed. However, differences remain with regard to standard of living, education, and organization of health care, which may be reflected in the variations in HDI. Variable factors suggested by the study authors may include compliance with chemotherapy protocol, health insurance coverage, educational status, and availability of care.

Provided by American Society of Hematology

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