ONLINE EXCLUSIVE

Diagnostic and Prognostic Biomarkers for Graft-Versus-Host Disease After Allogeneic Hematopoietic Stem Cell Transplantation

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PROBLEM IDENTIFICATION: A lack of testing options for the diagnosis and prognosis of chronic graft-versus-host disease (cGVHD) is a barrier to clinical management. Studies that have investigated the role of blood proteins as diagnostic and prognostic biomarkers for cGVHD were reviewed.

LITERATURE SEARCH: PubMed and Scopus databases were searched for articles published from January 1, 2000, to May 31, 2019. 660 articles were retrieved.

DATA EVALUATION: The authors appraised seven articles based on the inclusion and exclusion criteria to summarize identified blood protein biomarkers for cGVHD.

SYNTHESIS: Several blood proteins were identified as potential diagnostic and prognostic biomarkers. Most of these proteins are thought to be key contributors in cGVHD pathogenesis and, therefore, could be ideal biomarkers to guide clinical management.

IMPLICATIONS FOR PRACTICE: These biomarkers could aid providers in diagnosing cGVHD, identifying patients at high risk for development of cGVHD, and initiating preemptive therapy.

KEYWORDS allogeneic hematopoietic stem cell transplant; biomarkers; graft-versus-host disease
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Administration of donor stem cells, called allogeneic hematopoietic stem cell transplantation (allo-HSCT), is an effective therapeutic option for several hematologic malignancies. Allo-HSCT allows a patient to receive higher doses of chemotherapy and induce graft-versus-tumor effect for maximum tumor response. However, about 30%–70% of recipients after allo-HSCT will develop graft-versus-host disease (GVHD) (Zeiser & Blazar, 2017). The sequela of acute GVHD (aGVHD), chronic GVHD (cGVHD), or both after allo-HSCT can be a major cause of morbidity and mortality despite the use of immune-suppressive prophylaxis. Although the pathologic mechanisms are not clearly understood, the donor stem cells trigger an immunologic attack on single or multiple recipient organs, which can result in inflammation, decreased immunity, and fibrosis (Zeiser & Blazar, 2017). Depending on the severity of GVHD, the undesirable consequences can appear in the skin, gastrointestinal tract, liver, lungs, eyes, and genitals, and may cause functional and activity impairments, adverse general health, non-relapse mortality, dysfunctional organs, secondary malignancies, and poor quality of life (Wingard et al., 2011). Diagnosis of cGVHD can be particularly challenging because clinical manifestations may not present for as long as a year, and symptoms resemble other diseases, such as Sjögren's syndrome, scleroderma, wasting syndrome, chronic immunodeficiency, bronchiolitis obliterans, and primary biliary cirrhosis (Flowers & Vogelsang, 2009).

In an effort to predict and accurately diagnose GVHD, the role of biomarkers has shown potential benefit. Advances in protein biomarker research are paving the way for new tools in tackling diagnostic