■ Article

Application of Proteomics in Acute Graft-Versus-Host Disease Management:
An Integrative Review and Nursing Implications

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Background: After allogeneic hematopoietic stem cell transplantation, one of the major barriers to clinical management of acute graft-versus-host disease (aGVHD) is a lack of reliable and validated noninvasive tests for diagnosis and prognosis. Proteomic studies have indicated a strong correlation between the level of certain body fluid proteins and clinical outcomes after aGVHD. Specific proteins have been identified that could be robust biomarkers for overall prognosis or for differential diagnosis of target organs in aGVHD.

Objectives: The authors aimed to evaluate the literature related to proteomic biomarkers that are indicated in the occurrence, severity, and management of aGVHD.

Methods: PubMed and CINAHL® databases were searched for articles published from January 2004 to June 2014. Eight articles matching the inclusion criteria were identified, and the findings of these articles were summarized and their clinical implications noted.

Findings: Proteomics appears to be a promising tool to assist oncology nurses and nurse practitioners with patient education, develop personalized plans of care to reduce morbidity, initiate communication regarding end-of-life decisions, and improve overall nursing management of the population of patients with aGVHD.

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The efficacy of allogeneic hematopoietic stem cell transplantation (HSCT), a treatment option for some hematologic malignancies, is often limited by graft-versus-host disease (GVHD). GVHD results from an immunologic attack on target recipient organs or tissues (e.g., skin, gut, liver) by donor allogeneic T-cells and leads to death in greater than 15% of these recipients of HSCT (Pasquini, Wang, Horowitz, & Gale, 2010). Acute GVHD (aGVHD) occurs in about half of recipients of allogeneic HSCT, can be very debilitating, and often indicates a poor prognosis (Ferrara, Levine, Reddy, & Holler, 2009; Jagasia et al., 2012). Steroids are the first-line treatment for aGVHD, but, among patients with steroid-refractory aGVHD, the long-term mortality rate can still be greater than 90% (Blazar, Murphy, & Abedi, 2012).

Advances in proteomics, the study of the structural and functional roles of various proteins, have identified a number of body fluid proteins that may serve as biomarkers for the management of various diseases (Good et al., 2007). The application of these biomarkers could transform current aGVHD management modalities (Paczesny, 2013), including predicting the development of disease, facilitating early diagnosis, improving assessment of treatment response, and predicting patient survival. For oncology nurses caring for patients with aGVHD, familiarity with proteomic testing and interpretation of the results of these tests to prognosis and treatment options is imperative when developing the plan of care for and with these patients.

The major barrier to successful clinical management of aGVHD is the lack of diagnostic and prognostic tests. Laboratory tests could help identify patients who may not respond to therapy and patients at high risk for morbidity and mortality, and it could allow for earlier opportunities to individualize treatment plans in complex cases. Validated physiologic indicators