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Optimal screening for geriatric assessment in older allogeneic hematopoietic cell transplantation candidates

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ABSTRACT

Objective: Older patients who receive hematopoietic cell transplantation (HCT) may be at risk for adverse outcomes due to age-related conditions or frailty. Geriatric assessment (GA) has been used to evaluate HCT candidates but can be time-consuming. We therefore sought to determine the predictive ability of two screening tools, the Vulnerable Elders Survey (VES-13) and the G8, for abnormal GA or frailty.

Materials and Methods: We enrolled 50 allogeneic HCT candidates age ≥60 years. The GA included measures of medical, physical, functional, and social health. Frailty was defined as 3 or more abnormalities on grip strength, gait speed, weight loss, exhaustion, and activity. We associated baseline characteristics and abnormal GA or frailty. We determined the sensitivity and predictive ability of the VES-13 and G8 for GA and frailty.

Results: Overall, 33 (66%) patients (mean age 65.4 years) had an abnormal GA, and11 patients (22%) were frail. The G8 screening tool had a higher sensitivity for an abnormal GA (69.7%), and the VES-13 had a higher specificity (100%). Both tools had similar discriminatory ability.

Conclusions: Older HCT candidates had a significant number of deficits on baseline GA and a high prevalence of frailty. Existing screening tools may not be able to replace a full GA.

1. Introduction

Increasingly, older patients have been considered candidates for allogeneic hematopoietic cell transplantation (HCT).[1,2] Due to reduced-intensity and nonmyeloablative strategies as well as improvements in supportive care, older persons have attained survival rates that compare reasonably to those in younger patients.[3] In addition, older persons have been carefully selected for HCT based on disease status, comorbidity, and performance status.[4] Patients 55 and older treated for acute myelogenous leukemia (AML) or myelodysplastic syndrome (MDS) with HCT had a 2-year overall survival of 46%, with a 100-day mortality rate of 6%.[5] Transplant-related mortality (TRM) rates in persons 60 and older were not significantly different from patients 50 to 60 years,[6] with TRM rates of 5% at 100 days and 19% at 1 year.[5]

Geriatric assessment (GA) could be incorporated into existing HCT care to identify patients with an increased risk of adverse outcomes.[7,8] While higher comorbidity burden has

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been associated with poorer outcomes in HCT patients,[9] older persons are also at risk for other age-related conditions and geriatric syndromes associated with poor outcomes that are not routinely assessed as part of a pre-HCT evaluation.[7] GA is a multidimensional assessment not only of comorbidity, but also of other medical, social, functional, psychological risk factors in older persons.[10] GA has been validated in community dwelling older adults and in populations of older persons with cancer to identify those at increased risk of chemotoxicity, perioperative complications, disability, and mortality.[11,12] A recent study of GA in HCT found that a substantial number of older HCT patients had comorbidity, functional limitations, and frailty, a syndrome characterized by weakness, slow gait, malnutrition, low activity level, and exhaustion.[13]

In the coming decades, the substantial increase in the older population with cancer will mean that greater numbers of older persons who may be frail or have underlying deficits may be considered for HCT. Thus, a strategy to determine patients who are fit enough for HCT could aid in treatment decision-making. However, a GA can be time-consuming and requires the input of a multidisciplinary team that includes healthcare professionals trained in the care of older persons. Thus, a screening tool that helps to determine which patients are likely to benefit from GA would be useful to select patients for this intervention. Two such screening tools, the Vulnerable Elders Survey (VES-13)[14] and the G8 Screening Tool,[15,16] have been evaluated in older patients with cancer, but have not been adopted widely for older patients being considered for HCT.[17,18]

As part of a longitudinal pilot study to determine whether HCT was associated with the development of frailty and functional deficits in older persons, we performed a baseline assessment for older persons that included GA and assessment for the frailty syndrome. Our purpose in this cross-sectional study was to determine the utility of the VES-13 and the G8 screening tool score to identify patients who are likely to have an abnormal GA or the presence of the frailty syndrome.

2. Patients and Methods

2.1. Study Subjects

Our study included patients evaluated in the Stem Cell Transplantation and Cellular Therapy Center at the University of Texas MD Anderson Cancer Center between June 2010 and August 2012. We approached patients who were 60 years of age and older and English speaking who were considered for allogeneic HCT to treat hematologic disorders. We chose adults 60 and older as a group who benefit from reduced intensity induction strategies but also still have an increased risk of age-related illness.[19] All eligible patients were approached after their primary oncologic team determined that they were eligible for allogeneic HCT. An independent study coordinator collected all study data at a regularly scheduled visit prior to admission for HCT. The UT MD Anderson Cancer Center Institutional Review Board approved the study, and all enrolled subjects provided written informed consent prior to participation in the study.

2.2. Measures

All subjects completed a baseline evaluation, which included collection of demographic data and completion of a geriatric assessment (GA), Vulnerable Elders Survey (VES-13), and a frailty index. Demographic data included age, sex, race, marital status, education, and employment. Body mass index, disease status, and Karnofsky performance status were determined by the oncology team and were obtained from medical records through chart review after the baseline evaluation. Disease status at HCT was defined using established criteria based on bone marrow morphology. Criteria for response included normal cytogenetics, absence of circulating blasts, <5% marrow blasts, and platelet count ≥100 × 109/L. Laboratory values for ferritin, vitamin D, B-type natriuretic peptide, and C-reactive protein were also collected when available.

The primary outcome for the study was an abnormal GA, based on having 2 or more abnormal domains on GA prior to HCT. The GA included 8 domains: comorbidity, polypharmacy, nutritional status, physical performance, functional status, social support, psychological status, and cognition. Each domain was assessed using validated tools. We based our selection of tools and cut-off scores for each domain on previous studies of GA in older persons with cancer.[20] Where possible, we used tools that were either specific for the HCT population or had been used in an HCT population previously. For some GA domains that had not been assessed in HCT, we chose tools that might reasonably be sensitive and specific measures for deficits, with the understanding that the pre-HCT population may be a very highly select group of fitter patients. For example, in assessing cognitive function, we expected mild changes in various cognitive domains and would have preferred to screen for abnormalities in multiple cognitive areas.[21] However, to keep the GA to a reasonable length, we focused on brief measures of executive dysfunction, which has been described after HCT.[22] Thus, the Trail Making Tests A and B, which have been employed in the HCT population,[23] as well as the CLOX (a clock draw test),[24] which has not been used in HCT previously, were used. The summary of tools used for each domain is shown in Table 1. The GA was considered abnormal if a patient scored in the abnormal range for 2 or more of the different domains. Although this cutoff for abnormal GA has not been validated in HCT patients, a cutoff of 2 or more abnormalities on GA has been used in other studies of GA in geriatric oncology populations.[25]

A secondary outcome was the prevalence of frailty based on the number of deficits on a frailty index at baseline. We used Fried's criteria to determine frailty, which includes grip strength, gait speed, weight loss, low physical activity, and exhaustion.[47] A score of 3 or more abnormal tests defines the presence of frailty. Frailty is associated with increased risk of morbidity and mortality in community dwelling elderly persons and in older persons with cancer.[48–50]

We evaluated the ability of two screening tools to identify an abnormal GA and to identify individuals with the frailty syndrome. The VES-13 is a 13-item survey including age, self-rated health, and functional status, and is scored from 0 to 10, with 10 being the worst.[14] A cutoff of 3 or higher is considered abnormal, and each additional point on the VES-13 is associated with an incrementally higher risk of