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Fall-risk Prediction in Older Adults with Cancer: an unmet need

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Abstract

Falls in older adults with cancer are more common than in noncancer controls, yet no fall-risk screening tool has been validated in this population. We undertook a cross-sectional pilot study of the Falls Risk Questionnaire (FRQ) in 21 adults aged ≥65 receiving systemic cancer therapy. Participants completed the FRQ, geriatric assessment measures and a measure of fear-of-falling. The recruitment rate was 87.5%, with 95.2% completion of the FRQ and additional geriatric assessment and quality of life measures. The FRQ correlated significantly with the Timed Up and Go test (Pearson r 0.479, p=0.028). In addition, the FRQ score correlated directly with fear-of-falling and inversely with QOL, particularly physical health and neurotoxicity subscales. In conclusion, the FRQ was feasible in older adults receiving cancer therapy and correlates with measures of physical performance, functional status, and fear-of-falling. The FRQ may prove to be a valuable fall-risk screening tool to implement fall-prevention interventions in this vulnerable population of older adults with cancer.

Keywords

Cancer; Aging; Falls; Geriatric Assessment

Introduction

Falls in older adults are common, costly and deleterious, resulting in injuries, hospitalizations, fear-of-falling, functional decline, and nursing home placement. Older adults with cancer may be at greater risk for falls than noncancer populations(1). The current literature is inconclusive about predictors of falls in older adults with cancer. Most studies examining factors associated with falls were cross-sectional(2). Prospective studies have been limited by inconsistent results regarding factors predictive of falls.(3–6) Thus, there is a gap in knowledge regarding predictors of falls in older adults with cancer, which limits our

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ability to identify individuals at risk and reveals the need for a validated screening tool for fall-risk in this population.

The 12-item Falls Risk Questionnaire (FRQ) is a simple self-administered questionnaire, highly predictive of fall-risk based on clinical geriatrics exam in a noncancer population(7). In this pilot study, we aimed to demonstrate feasibility of performing the FRQ in the oncology setting, examine its validity compared to a physical performance measure, and explore associations between the FRQ, geriatric assessment (GA) domains and fear-of-falling and QOL measures.

Methods

With the approval of the Washington University School of Medicine Human Subject Committee, we undertook a cross-sectional study of the FRQ in older adults with cancer. Eligible patients were aged ≥ 65 with a diagnosis of cancer and currently receiving or initiating systemic cancer therapy (endocrine therapy, chemotherapy or targeted therapies) within one month. To ensure representation across the age spectrum, we enrolled 5 patients in each age cohort: 65–69, 70–74, 75–79, ≥80. Exclusions were: the inability to understand written English, to walk or to adhere to study requirements.

Measures

Participants completed the FRQ, the Falls Efficacy Scale-International (FES-I) (8) and the Functional Assessment of Cancer Therapy – Gynecologic Oncology Group – Neurotoxicity (FACT-GOG/NTX) QOL scale (9) in paper form at a clinical oncology visit. The GA included demographics, functional status including Instrumental Activities of Daily Living (IADLs) (10), and medications. Falls were assessed using the PROFANE definition of falls (11). Participants also completed the Timed Up and Go (TUG) physical performance test. Comorbidities were assessed by medical record review using the Charlson Comorbidity Index (12)

Feasibility

The primary measure of feasibility was percent completion of the FRQ, the TUG test and the GA, FES-I and FACT-GOG/NTX questionnaires. Feasibility was *a prior* defined as >85% successful completion of these measures. Additional measures of feasibility included the recruitment rate, defined as the number of individuals who consented out of the number of potential participants approached, the time to complete the assessments and satisfaction with the questionnaires.

Statistical analyses

As a pilot study, only descriptive analyses were planned. FRQ and other questionnaire results were summarized using descriptive statistics. Exploratory analyses examining relationships between the score on the FRQ and other assessment items were undertaken using Pearson correlation, chi-square and Student’s T-tests as appropriate using SPSS version 23.

Results

In August and September of 2014, 21 patients enrolled. The median age was 76 years (range 65–89). The most common cancer types were breast (7), myeloma (5) and hepatobiliary (2). Treatments included conventional chemotherapy in 7, endocrine therapy in 9 and novel/targeted agents in 6 (1 patient received both conventional chemotherapy and a targeted agent). See Supplementary Table 1 for participant characteristics.

The recruitment rate was 87.5% (21 consented of 24 approached). The primary outcome was met, with 95.2% (20/21) participants completing the entire assessment, including the FRQ, GA, TUG and FACT-GOG/NTX. One participant completed the FRQ, GA and TUG but declined to complete the FES-I and FACT-GOG/NTX. The median time to completion of the entire assessment was 35 minutes (range 14–71), with a median of 5 minutes (range 2–12) for completion of the healthcare provider portion of the assessment (including the TUG) and 27 minutes (range 10–60) for the self-administered questionnaires. Only 2 of 21 participants required assistance with questionnaire completion. Two participants noted difficult questions in the questionnaires.

Geriatric syndromes were common, with 13 reporting ≥1 IADL limitations, 8 having ≥1 comorbidities and frequent polypharmacy [median 9 medications (range 4–20)].

Nearly one-fifth of participants (4/21)reported a fall in the past six months, and 6 reported a fall within the past year. The median score on the FRQ was 5 ± 3.3 (range 0–14). Fifteen participants scored ≥4 on the FRQ.

The score on the FRQ significantly correlated with the TUG (Pearson r 0.479, p=0.028), supporting its face validity as a screening tool for fall-risk. Exploratory analyses of correlations between the FRQ, FES-I, QOL and IADLs are shown in Table 1.

Discussion

Falls are a common problem in older adults with cancer. Up to 50% of individuals in a palliative care population fell over a 6 month period(5), and about 20% of older adults starting a course of chemotherapy fell within the prior 6 months(13). A recent study by Guerard et al demonstrated how infrequently falls are addressed in the oncology setting(14). Among 125 patients who reported a fall in the prior 6 months during a geriatric assessment, it was only noted in the medical record in 10%; only 6% were referred to geriatrics, physical therapy or occupational therapy. The Institute of Medicine has recently called for “substantial adjustments in the current model of care delivery…to ensure that the care of older adults with cancer is well coordinated and comprehensive”(15). Because older adults undergoing cancer therapy receive the majority of their healthcare in the oncology setting, (16) well-coordinated care must include attention to falls, identification of at-risk individuals and intervention to prevent falls.

Falls are potentially preventable.(17) Interventions may include exercise, medication review, environmental modification, education programs or multicomponent interventions. Fall-prevention intervention in older adults with cancer has a greater likelihood of

implementation if it is targeted to the individuals at greater risk. A brief, self-administered questionnaire may have a greater likelihood of implementation in clinical oncology practice than a physical performance measure such as the TUG, which requires a trained individual and space to complete. The Falls Risk Questionnaire provides one such opportunity for efficient fall-risk ascertainment in this population.

In this pilot study, we demonstrated that administration of the FRQ in the oncology setting is feasible, with 20 of 21 of participants completing the entire assessment. The FRQ correlated moderately with the TUG, a sensitive and specific physical performance test for fall-risk (18), supporting the potential utility of this instrument in identifying older adults with cancer at greater fall-risk. Over 70% of participants had a FRQ score of ≥4, a cutoff which has 100% sensitivity and 83.3% specificity for fall-risk by clinical geriatrics exam (7)

In community populations, falls are associated with poorer quality of life. In our study, higher fall-risk on the FRQ was significantly correlated with poorer QOL. Similarly, greater concern about falling on the FES-I was associated with poorer QOL. Given that fall-prevention interventions improve QOL (19), interventions to prevent falls in individuals undergoing cancer treatment may also reduce fear-of-falling and improve QOL.

Limitations of this study include the small sample size, which prohibited multivariate evaluation of associations among FRQ results and other components of the geriatric assessment. The cross-sectional design only demonstrates an association between the FRQ and other fall-related risk factors, but does not allow us to examine whether baseline factors prospectively predict falls.

In summary, the FRQ is feasible in older adults undergoing cancer therapy. It correlates significantly with the TUG and may provide a useful screening tool for fall-risk among older adults receiving cancer therapy, without requiring oncology care teams to be specially trained in fall-risk assessment. Prospective study is necessary to determine its value as a screening tool to predict falls in this population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Correlation matrix among FRQ, FES-I, Quality of life (total and domains), and IADLs[a]

	TUG	FES total	FACT total	FACT PH	FACT SWB	FACT EWB	FACT FWB	FACT NTX	IADL
FRQ Total	**0.479** *	**0.763** **	**−0.626** *	**−0.688** *	0.128	−0.133	**−0.457** *	**−0.663** **	**0.719** *
TUG		**0.707** **	−0.290	−0.434	−0.243	0.357	−0.248	−0.200	**0.453** *
FES total			**−0.569** *	**−0.759** *	0.061	−0.006	−0.372	**−0.567** **	**0.645** *
FACT total				**0.766** **	0.295	**0.449** *	**0.826** **	**0.715** **	**−0.761** **
FACT PH					0.013	0.142	**0.528** *	**0.604** **	**−0.655** *
FACT SWB						−0.100	0.273	−0.197	0.005
FACT EWB							0.273	0.284	−0.185
FACT FWB								0.388	**−0.661** *
FACT NTX									**−0.720** **

[a]Interpretation notes: Higher FRQ score indicates greater risk for falls; higher TUG time indicates poorer physical performance. Higher FES score indicates greater fear-of-falling. Higher FACT scores (total and domains) indicate better quality of life.

*p<0.05;

**p<0.01

FRQ, Falls Risk Questionnaire; TUG, Timed Up and Go; FES-I, Falls Efficacy Scale – International; FACT – Functional Assessment of Cancer Therapy – Gynecologic Oncology Group Neurotoxicity Scale; PH, Physical Health section; SWB, social/family well-being; EWB, emotional well-being; FWB, functional well-being; NTX, neurotoxicity subscale; IADL, instrumental activities of daily living