Frailty screening methods for predicting outcome of a comprehensive geriatric assessment in elderly patients with cancer: a systematic review

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CRD summary
This review concluded that available frailty screening methods had insufficient discriminative power to select patients for further assessment and that it may be beneficial for all elderly patients with cancer to receive a comprehensive geriatric assessment. These cautious conclusions reflect the available data and are likely to be reliable.

Authors’ objectives
To assess the diagnostic performance of frailty screening methods to predict the presence of impairments on a comprehensive geriatric assessment in elderly patients with cancer.

Searching
MEDLINE and EMBASE were searched without language restrictions from inception to December 2011; search terms were reported. Conference proceedings from five relevant meetings (2007 to 2011) were searched manually.

Study selection
Studies were eligible for inclusion if they assessed the performance of any frailty screening method in predicting the outcome of a comprehensive geriatric assessment in elderly patients with cancer. A comprehensive geriatric assessment was defined as using validated methods to investigate at least three domains from cognitive function, mood and depression, nutritional status, activities of daily living, instrumental activities of daily living, comorbidities, polypharmacy, mobility and falls, and social support. A comprehensive geriatric assessment was considered adequate if it included, as a minimum, assessment of functional status, cognition and mood.

Studies of mixed populations that included non-cancer patients were excluded. Studies that performed comprehensive geriatric assessment in only a subgroup of patients selected using the outcome of frailty screening were excluded. Eligibility for studies that included more than one screening method was assessed separately for each method.

Included studies were conducted between 2006 and 2011. Twelve out of 14 studies were conducted in hospital medical oncology departments. The median age of study participants ranged from 72 to 80 years. Seven studies included patients with various types of cancer: five focused on a single type and two were unspecified. Various frailty screening methods were assessed (Vulnerable Elders Survey-13, Geriatric 8, Groningen Frailty Index, Triage Risk Screening Tool, Fried frailty criteria, abbreviated Comprehensive Geriatric Assessment and Barber). All frailty screening methods assessed functional status; most also address psychosocial functioning. Content of the comprehensive geriatric assessment varied between studies; the median number of domains examined was seven (range four to eight) and all studies included an assessment of cognitive function and activities of daily living.

Initial screening of titles and abstracts was done by one reviewer. Two reviewers then screened all potentially relevant articles.

Assessment of study quality
Methodological quality of included studies was assessed by two reviewers using the QUADAS-2 tool. Any disagreements were resolved by consensus or by consultation with a third reviewer.

Data extraction
Sensitivity, specificity and positive and negative predictive values (or data to calculate these) were extracted by two reviewers independently. Study authors were contacted for additional data where necessary.

Methods of synthesis
Studies were combined in a narrative synthesis. Sensitivity and specificity estimates for each frailty screening method were summarised in text and tables and plotted in receiver operating characteristic (ROC) space.
Results of the review
Fourteen studies (3,980 participants, median 117, range 41 to 1,425) were included in the review. For the patient selection and flow and timing domains, risk of bias was generally considered low and there were few concerns about the applicability of the study populations. Details of blinding were often poorly reported so risk of bias for the index test and reference standard domains was frequently unclear. Variation in content of comprehensive geriatric assessment led to concerns about applicability in the reference standard domain.

Prevalence of frailty varied widely between study populations (median 68%, range 28% to 94%).

For the Vulnerable Elders Survey-13 (nine studies), median sensitivity and specificity values were 68% (range 39 to 88%) and 78% (range 62% to 100%).

For Geriatric 8 (six studies), the median sensitivity and specificity values were 87% (range 77% to 92%) and 61% (39% to 75%).

The Groningen Frailty Index was assessed by three studies. Reported sensitivities ranged from 39% to 62% and specificities ranged from 69% to 87%.

The Triage Risk Screening Tool was assessed by two studies (three data sets) that reporting sensitivities of 64% to 92% and specificities in the range 43% to 100%.

Two studies that assessed the Fried frailty criteria reported sensitivities of 25% and 37% and specificities of 96% and 86%.

The Comprehensive Geriatric Assessment was assessed by one study that found sensitivity to be 51% and specificity to be 97%.

Barber was assessed by one study that found sensitivity to be 59% and specificity to be 79%

Although there was a high prevalence of frailty in most study populations, even those screening methods with the highest sensitivity yielded negative predictive values of around 60%. Full details of positive and negative predictive values were reported in the article.

Authors’ conclusions
Geriatric 8 and Triage Risk Screening Tool showed the best sensitivity for predicting frailty on comprehensive geriatric assessment in elderly patients with cancer but had poor specificity and negative predictive value.

CRD commentary
The review provided a clear objective and defined appropriate inclusion criteria. Several sources were searched for relevant studies; the search included potential sources of unpublished material and no language restrictions were applied. Measures to minimise error and bias were applied throughout the review process and the methodological quality of included studies was assessed and reported in full. Use of a narrative synthesis was appropriate given the apparent differences between studies.

The authors’ cautious conclusions reflect the available evidence and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors stated that, for the time being, it might be beneficial for all elderly patients with cancer to receive comprehensive geriatric assessment since the available frailty screening methods had insufficient discriminative power to select patients for further assessment.

Research: The authors stated that it may be possible to develop targeted screening methods with better sensitivity and specificity once the relative importance of individual geriatric domains and the benefits of appropriate interventions and follow-up were fully elucidated in this population.

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