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Original Article

Use of Comprehensive Geriatric Assessment and Geriatric Screening for Older Adults in the Radiation Oncology Setting: A Systematic Review

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Abstract

Aims: Comprehensive geriatric assessment (CGA) is a multidisciplinary diagnostic process that evaluates medical, psychological, social and functional capacity. No systematic review of the use of CGA in radiation oncology has been conducted. This paper reviews the use of CGA in radiation oncology, examines whether such assessments are feasible and evaluates the effectiveness of these assessments in predicting and modifying outcomes.
Materials and methods: We searched Medline, EMBASE, PsycINFO, CINAHL and the Cochrane Library for articles published between 1 January 1996 and 24 January 2017.
Results: Twelve non-randomised studies were identified; four studies used a geriatric screening tool only and the eight other studies combined a screening tool with a CGA. Most studies had small samples (mean 63 participants). Two studies identified a significant (95% confidence interval 1.5–4.8 and 1.5–6.9) association between an abnormal screening and increased risk of mortality. One study showed an ability of the CGA to influence treatment decision making, whereas six papers suggested a non-significant association between the screening tool/CGA and treatment tolerance.
Conclusion: The studies suggest the feasibility of using a screening tool to select patients for CGA. 'Vulnerability' showed a non-statistically significant association with treatment tolerance, but a significant association with mortality.

Key words: Aged; comprehensive geriatric assessment; frail elderly; radiation oncology; systematic review

Introduction

Cancer is a disease of older adults. In North America and Europe, the majority of persons diagnosed with cancer every year are aged 65 years or older [1]. The US National Comprehensive Cancer Network and the International Society of Geriatric Oncology (SIOG) [2,3] have recommended that some form of comprehensive geriatric assessment (CGA) should be conducted to help cancer specialists determine the most optimal cancer treatment for their older patients.

CGA is a multidimensional, interdisciplinary evaluation used primarily by geriatricians for several potential purposes. Although no standardised tools have been developed, such a global assessment is used to determine physiological, as opposed to chronological, age. The benefits of CGA have been shown in many geriatric medicine settings and include greater diagnostic accuracy, improved functional and mental status, reduced hospitalisation and improved survival and quality of life [4]. There is growing evidence in the oncology literature showing the value of CGA in guiding cancer-directed treatment plans for older patients [5]. Potential benefits include predicting

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complications of treatment, estimating survival time and detection of problems not found using standard oncology performance measures, such as the Karnofsky score. The evaluation is also used to determine whether a patient is fit, vulnerable or frail. CGA is used as a tool to guide future diagnostic and therapeutic interventions, i.e. to determine any reversible deficits in older persons and devise treatment strategies to eliminate or mitigate such deficits. CGA is also used to assist in treatment decision making by clinicians by helping to risk stratify patients before potentially high-risk therapy [6,7]. A CGA generally includes validated tools that assess several domains important in determining physiological age: comorbidity, functional status, physical performance, nutritional status, polypharmacy, social support, cognition and psychological status (depression and anxiety). CGA is resource intense, and screening tools to select patients who are most likely to derive benefit from CGA have been developed and studied.

There have been several systematic reviews of CGA in oncology settings published [5,8,9]. However, none of these reviews examined the available evidence by cancer treatment modality and there has not been any systematic review examining the value of CGA in the radiation oncology setting. As treatment technologies continue to evolve, radiation oncologists will have an increasing ability to narrow the therapeutic index and personalise treatment. Hence, accurate assessment of cancer patients is becoming increasingly important. A focus on CGA in the radiation treatment setting is relevant as this modality may be delivered to patients deemed unsuitable for chemotherapy, due to its lack of systemic toxicities.

The objectives of this systematic review are: (i) to provide an overview of all CGA instruments and geriatric screening tools that are used in the radiation oncology setting for older adults with cancer; (ii) to examine the feasibility of CGA and geriatric screening use in the radiation oncology setting (time needed to complete, proportion of patients with complete assessments) and the psychometric properties or diagnostic accuracy of the instruments (reliability, validity, sensitivity and specificity); and (iii) to systematically evaluate the impact of CGA instruments and geriatric screening tools on the radiation therapy treatment decision-making process and their effectiveness in predicting cancer and treatment outcomes.

Materials and Methods

Data Sources

We searched OVID Medline (1946 to present, including Epub Ahead of Print and In Process and Other Non-Indexed Citations), OVID Embase (1947 to present), OVID PsycINFO (1806 to present), EBSCO CINAHL Plus with Full Text (1981 to present) and Cochrane Central to identify articles addressing the subject of CGA and frailty assessment in patients undergoing radiation (see [Supplementary Figure S1]). Search strategies were developed by two academic health science librarians (APA and MG) with input from the project leads. The search strategies were translated using each database platform's command language, controlled vocabulary and appropriate search fields. MeSH terms, EMTREE terms, APA thesauri terms, CINAHL headings and text words were used for the search concepts of radiation and CGA.

Language limits were applied to capture articles in: English, French, Dutch and German, in all databases. Final searches were completed in April 2016 and a search to capture more recent articles was carried out in January 2017. (For full strategies, see Supplementary Figure S1) We also reviewed the reference lists of the selected articles to identify articles that would be relevant for our search, which did not lead to the inclusion of any other studies.

Study Inclusion Criteria

Original research that reported on older patients (mean/median age of study participants 65 years and over) diagnosed with cancer and being seen in radiation oncology clinics/considered for radiation treatment. A study that included older adults considering a variety of treatment modalities was eligible if:

- it reported a subgroup analysis for those with radiation therapy or over 50% of the study population was receiving/planned for radiation therapy;
- it reported on cross-sectional or prospective, observational or controlled interventional studies that either assessed the feasibility of the use of tools/instruments or effectiveness of geriatric assessment tools and geriatric risk screening tools on any of the aforementioned outcome measures;
- it was written in English, French, Dutch or German.

Articles were excluded if:

- they were editorials, case studies, review or expert opinion paper;
- they were published as abstracts only.

Process of Study Selection

The studies were selected in two steps (see Figure 1) using Covidence [10]. First, an initial selection based on titles and abstracts was carried out independently by two independent reviewers using the inclusion and exclusion criteria. In case of uncertainty, the abstract was included for full-text review. Next, the full text was reviewed independently by two reviewers using the same inclusion and exclusion criteria. Disagreements between the reviewers were resolved by consensus with a third team member involved.

Data Abstraction

Data were abstracted using a data abstraction form in Excel by the same reviewers. The abstracted data included study design, aim of study, location of study, sampling

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