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Completion of radiotherapy is associated with the Vulnerable Elders Survey-13 score in elderly patients with cancer

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ABSTRACT

Objectives: Vulnerability assessment of geriatric patients with cancer may contribute to improved anti-cancer treatment with maximal results and minimal side effects. The aim of the present study was to evaluate whether the Vulnerable Elders Survey-13 (VES-13) score is associated with completion of radiotherapy among elderly patients with cancer.

Materials and Methods: This was a prospective observational study that included patients greater than age 75 with histologically confirmed cancer disease, referred to the Department of Radiation Oncology to receive radical or palliative radiotherapy, from 2010 to 2012. VES-13 forms were filled in before the initiation of radiotherapy and scores were assigned according to a standardized scoring procedure.

Results: Of a total of 230 participants (median age 78.5 years), 41 (17.8%) did not complete radiotherapy. These patients had higher VES-13 scores (median with interquartile range: 5 [2–8.5]) compared to those who completed the treatment (3 [1–7]; P = 0.008). A VES-13 score >3 was associated with 2.14 times higher probability of not completing radiotherapy, whereas in patients with scores >7 this probability was 3.34 times higher. The association between higher VES-13 scores and non-completion of radiotherapy was independent of other factors, such as age, sex, comorbidities, type of radiotherapy, and presence of side effects.

Conclusion: Patients with higher VES-13 scores had increased probability of not completing radiotherapy in our study, and this effect was independent of other factors that might affect radiotherapy completion.

1. Introduction

Cancer is a strongly age-related disease as its incidence rises with age. It is estimated that almost 25% of newly diagnosed cancer cases are diagnosed in elderly patients aged 65 to 74 years, almost 22% in elderly patients aged 75 to 84 years, and approximately 7.5% in the so-called 'oldest old' geriatric population aged 85 or above [27]. Due to increased life expectancy and aging in the Western population, the percentage of the European population aged 65 years and older is projected to increase from 17.1% (84.6 million) in 2008 to 30.0% (151.5 million) in 2060 [5]. As a consequence, the number of older patients diagnosed with a malignant disease will increase.

Oncologists who treat older patients with cancer face two major issues while developing therapeutic strategies for these patients. The first issue is that elderly patients are usually under-represented in clinical trials [6,9,24], although when they are asked to participate there is no significant difference in participation between younger and older patients [7]. Therefore it is difficult to reach evidence-based treatment recommendations for these patients. Consequently, these patients are often under- or over-treated with therapies that

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have not been tested in relevant clinical trials [4]. Furthermore, the likelihood of receiving any kind of treatment decreases significantly with age [8,11,25].

The second important issue is that geriatric patients are a heterogeneous group with respect to their general health status [19,20]. Aging is a highly individualized process and all the physical and psychological changes implicated in this process cannot be predicted just on the basis of chronological age. The spectrum of dysfunction ranges from elderly who are independent, with a mild risk of health deterioration to those who are absolutely dependent and at high risk of functional disability [3,23]. Some elderly patients tolerate anticancer treatment as well as younger patients, while others experience severe toxicity, requiring treatment reduction, delay or permanent discontinuation of treatment, while others might be in a situation where the best treatment option is not to treat at all. Thus, a major issue faced by oncologists treating older patients with cancer is how to effectively select patients suitable for treatment, and whether to treat these patients with standard protocols (standard dose and interval) or with adapted regimens.

A comprehensive geriatric assessment (CGA) is a well-established comprehensive approach to the evaluation of older patients [17]. It includes the evaluation of several criteria in older patients with cancer: functionality, mobility/risk of falls, cognition, depression, comorbidity, polypharmacy, social situation, and geriatric syndromes. CGA data can be used to generate treatment decisions and plan interventions [19]. According to CGA results, patients can be classified into three groups for treatment decisions: a) fit patients, b) vulnerable patients, and c) frail patients. Fit elderly patients can receive almost any form of cancer treatment, as they tolerate anti-cancer treatment as well as younger patients, with similar outcomes in terms of survival. Patients in the frail group are usually offered only best supportive care, while for the vulnerable patients, which is the most challenging category, individualized approaches and specific clinical trials are recommended [19]. On the other hand, it should be noted that CGA is a time-consuming, staff-intensive procedure that is difficult to use in every-day clinical practice and a more feasible approach should be adopted. Because of these difficulties, several screening tools are used to assess the vulnerability of elderly patients [13,23].

The Vulnerable Elders Survey-13 (VES-13) is a self-administered questionnaire that consists of 12 items for functional capacity, physical status, the patient's perception of their health, and one question on age [23]. It is an easy screening tool because it can be administered by non-medical staff in 5 min [15,28]. VES-13 identifies a group of patients with a score of ≥ 3 (vulnerable group), which have 4.2 times higher risk of death or functional decline over a 2-year period compared to patients with scores <3 [23]. The VES-13 score has also been used in elderly patients to predict the risk of death and functional limitation in numerous other clinical and research settings [1,12,21]. In a pilot study, VES-13 accurately identified elderly patients with prostate cancer who were defined as having impairment by CGA [16].

In this study, we sought to evaluate whether the VES-13 score is associated with the completion of a prescribed course of radiotherapy in elderly patients with cancer. We hypothesized that failure to complete radiotherapy may be related to vulnerability and the general health status of these patients which, in turn, might be accurately reflected by the VES-13 score.

2. Methods

2.1. *Study Population*

This prospective observational study included patients referred to the Department of Radiation Oncology in the years 2010, 2011 and 2012, in order to receive radical or palliative radiotherapy. Eligibility criteria were: a) age greater than 75 years, b) histologically confirmed cancer disease (irrespectively of the primary site or stage), c) agreement to receive radiotherapy, and d) ability to understand and complete the VES-13 in Greek. Patients who died before the completion of radiotherapy were excluded. The study was approved by the Ethics Committee of the University Hospital of Patras, and a written informed consent was obtained from participants.

2.2. *Data Collection*

Data were collected from all consented patients aged 75 or older, referred to the Department of Radiation Oncology between 2010 and 2012. Demographic data included age, sex and tumor type.

All patients were asked to fill in the VES-13 form before initiating radiotherapy treatment. The content of the survey was first read aloud and explained in detail by one of the doctors, to make sure that the patient understood it. The form was completed by the participant in the presence of the doctor and, depending on patient's needs, in a presence of an escort, who was not allowed to intervene in responses. No time limits were applied for the process. After completion, each survey was reviewed for consistency and a score was assigned as follows: a) Age: 1 point for age 75–84 and 3 points for age ≥ 85; b) Functional abilities (ability in shopping, managing money, walking, doing light housework, and bathing or showering): 0 (no disability) — 4 points; c) Limitations in physical abilities (stooping, crouching or kneeling, lifting or carrying objects as heavy as 10 lb, reaching or extending arms above shoulder level, writing or handling and grasping small objects, walking a quarter of mile and performing heavy housework): 1 point for each physical task, maximum of 2 points; and d) Self-rated health status: 1 point if considered fair or poor. The final score ranged between 1 (because of age) and 10. Patient's responses and the final VES-13 score were stored in a digital database.

The decision to treat radically or palliatively and the applied radiotherapy technique were based on clinical criteria, according to the guidelines followed in the Department.

The primary outcome of interest was the completion of the prescribed course of radiotherapy. Patients who received 100% of the prescribed dose (or its radiobiological equivalent) were considered as "treatment completion". According to our in-house policy, an adjustment of the radiotherapy regimen is possible depending on clinical and radiobiological criteria.