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Clinical Investigation

Funding Support and Principal Investigator Leadership of Oncology Clinical Trials Using Radiation Therapy

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Summary

What are the sources of funding for trials using radiation therapy (RT), and what proportion of RT trials have radiation oncologist (RO) principal investigators (PIs)? Among active trials using RT, 14% received industry funding, 27% of trials based in the United States received funding from the National Institutes of Health, and 95% received alternate funding. Industry-funded trials are less likely to have RO PIs or evaluate RT-only treatment, and RO PIs are less likely to lead trials incorporating drug therapy and are more

Purpose: Sources of funding and principal investigator (PI) leadership for clinical trials using radiation therapy (RT) are not well characterized but are important mediators of innovation, particularly because funding for trials from the National Institutes of Health (NIH) has decreased and industry funding has increased. We sought to determine characteristics of trials using RT that are associated with industry funding, NIH funding, and radiation oncologist (RO) PI leadership.

Methods and Materials: www.ClinicalTrials.gov was queried for all open, interventional trials that administered RT. Logistic regression was used to identify associations between trial characteristics, receipt of funding type (NIH, industry, or other), and PI leadership.

Results: The authors identified 1469 oncology trials, of which 41% were based in the United States, 56% were based internationally, and 3% were based in the United States and internationally. Of these, 22% were RT monotherapy, 53% were bimodality (40% RT + drug, 13% RT + surgery), and 24% were trimodality. Although ROs led 60% of all trials, industry-sponsored trials were significantly less likely to have RO PIs (35% RO vs 65% non-RO PI; adjusted odds ratio [aOR], 0.45; 95% confidence interval [CI], 0.28-0.73), to fund trials that did not incorporate drug therapy (aOR, 0.19; 95% CI, 0.10-0.35), or to fund phase III trials (aOR, 0.25; 95% CI, 0.11-0.60) because industry-sponsored trials favored smaller phase I trials. NIH-funded trials were not associated with PI type and, although not statistically significant, favored larger phase

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dependent on alternative funding.

III trials (unadjusted OR, 2.06; 95% CI, 0.99-4.29). ROs were less likely to lead trials incorporating drug therapy (aOR, 0.30; 95% CI, 0.22-0.41).

Conclusions: ROs are less likely than other specialties to lead trials that use RT in combination with drug therapy or surgery and more likely to lead trials supported by nonindustry, non-NIH funding. This suggests a need for ROs to lead multimodality trials and to consider opportunities to interact with industry. As NIH resources decrease, alternative funding is needed to support innovation, particularly in in RT-alone trials.

Introduction

Radiation therapy (RT) is among the most frequently used treatment modalities for patients with cancer, with over 50% of patients expected to receive RT during their disease course (1), a figure that is projected to increase in the coming decade (2). The number of novel anticancer agents in development has risen sharply over the past few years, concurrent with innovations in RT technology such as image-guided RT and the expanded use of stereotactic body RT (SBRT). Despite the increase in novel anticancer agents, a notable lack of agents has been approved by the US Food and Drug Administration in combination with radiation, with the most recent being cetuximab, approved to be combined with RT for head and neck cancer in 2006. Well-designed clinical trials are critical to determine the safety and efficacy of developments in RT monotherapy and in combination with systemic therapy and surgery.

Although there have been significant advances in cancer therapy in recent years, these developments come at a time of increasingly difficult funding challenges. From 2006 to 2014 the number of National Institutes of Health (NIH)-sponsored clinical trials has declined by 24% (3). Over the same period, there was a 22% reduction in the capacity of the NIH to fund research because of budgetary cuts, sequestration, and inflationary losses (3). Meanwhile, the number of industry-sponsored trials has increased by 43%, suggesting an increasingly important role for building relationships between investigators and members of industry (3).

Given the evolving complexity of RT and the frequency of its use in cancer care, it is important that radiation oncologists (ROs) are actively involved in the design and successful implementation of clinical trials in oncology, particularly those using RT. ROs are uniquely trained in concepts of radiobiology, technical aspects of radiation delivery, and other radiation-specific considerations that may enhance trial design. We sought to characterize the current landscape of active interventional trials involving RT as a therapeutic modality. The goal of our study is to evaluate the source of funding for trials using RT and to determine the extent of RO principal investigator (PI) leadership of such clinical trials, thereby informing the potential need for future funding sources for RT trials and initiatives to support RO investigators.

Methods and Materials

Data source

ClinicalTrials.gov is an online, self-reported public registry and results database operated by the National Library of Medicine for both publicly and privately financed clinical trials from around the world (4). It is currently the largest international registry of clinical trials. US federal law and multiple international and organizational bodies, including the International Committee of Medical Journal Editors, World Health Organization, European Union, Association of American Medical Colleges, and some medical journals mandate that interventional trials register with ClinicalTrials.gov (5).

We queried ClinicalTrials.gov using the search terms "cancer AND radiotherapy," "cancer AND radiation," and "cancer AND RT." We limited our query to active, interventional trials with a status of not yet recruiting, recruiting, and enrolling by invitation only as of December 16, 2016. Exclusion criteria included studies evaluating noncancer diagnoses, trials studying only a pediatric population (defined as ages 0-21; trials including both pediatric and adult patients were included), trials not including RT as part of the trial-prescribed intervention, trials involving radiopharmaceuticals only (eg, trials for radioactive iodine ablation for thyroid cancer), and trials involving total body irradiation as part of transplant conditioning regimens (without another RT modality).

The number of oncologic interventional trials was determined using the search condition, "cancer" with no other limitations. To estimate the number of oncologic interventional trials that opened in specific years, the additional search terms of "radiation" or "irradiation" or "radiotherapy" were used.

Data collection

Using the data extracted from www.ClinicalTrials.gov, we determined the medical specialty of the PI using a web-based search for their academic or practice website. The PI was characterized as an RO, medical oncologist, surgeon, clinical oncologist (ie, an oncologist who may practice both radiation and medical oncology, eg, in the United Kingdom),