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Clinical Investigation: The Profession

Physician Evaluation of Internet Health Information on Proton Therapy for Prostate Cancer

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Summary

Many patients considering prostate cancer treatment options report seeking proton beam therapy based, in part, on information readily available on the Internet. There are, however, shortcomings in quality and accuracy in consumer-oriented Internet health information on proton beam therapy for prostate cancer.

Purpose: Many patients considering prostate cancer (PCa) treatment options report seeking proton beam therapy (PBT) based in part on information readily available on the Internet. There is, however, potential for considerable variation in Internet health information (IHI). We thus evaluated the characteristics, quality, and accuracy of IHI on PBT for PCa.

Methods and Materials: We undertook a qualitative research study using snowball-purposive sampling in which we evaluated the top 50 Google search results for "proton prostate cancer." Quality was evaluated on a 5-point scale using the validated 15-question DISCERN instrument. Accuracy was evaluated by comparing IHI with the best available evidence.

Results: Thirty-seven IHI websites were included in the final sample. These websites most frequently were patient information/support resources (46%), were focused exclusively on PBT (51%), and had a commercial affiliation (38%). There was a significant difference in quality according to the type of IHI. Substantial inaccuracies were noted in the study sample compared with best available or contextual evidence.

Conclusions: There are shortcomings in quality and accuracy in consumer-oriented IHI on PBT for PCa. Providers must be prepared to educate patients how to critically evaluate IHI related to PBT for PCa to best inform their treatment decisions.

Introduction

Nearly 80% of adults in the United States use the Internet, compared with 14% in 1995 (1). There has been a concomitant increase in Internet use to find health information. A 2010 survey found that 80% of Internet users (ie, 59% of all adults in the United States) searched online for health information (2), compared with 25% only a decade earlier (3). The emergence of the Internet as a source of health information underscores the

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Table 1 Characteristics of prostate cancer websites (n = 37)

Characteristic	n (%)
Focus	
Proton therapy exclusively	19 (51)
Prostate cancer	18 (49)
Affiliation	
University	13 (35)
Commercial	14 (38)
Nonprofit	4 (11)
Unknown	6 (16)
Type	
Patient information site	17 (46)
Blog	7 (19)
Scientific article	3 (8)
Newspaper	4 (11)
Other information site	6 (16)

importance of assessing the quality and accuracy of Internet health information (IHI) to better inform medical decision making.

Nearly 242,000 men in the United States will receive a diagnosis of prostate cancer (PCa) this year (4). The "treatment bazaar" (5) of options available to many men with localized PCa includes surgery, radiation, and expectant management (active surveillance or watchful waiting). Radiation therapy can include brachytherapy, x-ray therapy (such as intensity modulated radiation therapy [IMRT]), and proton beam therapy (PBT). PBT is becoming increasingly available in the United States: there are 10 operational PBT centers with another 7 in development (6). As such, PBT has attracted substantial national media attention in recent years for the treatment of PCa despite a scarcity of comparative effectiveness evidence (7).

Many patients considering PCa treatment report seeking PBT based in part on freely available IHI (8). Such information includes peer-reviewed scientific articles, blogs, discussion forums, and patient support sites. There is, however, potential for considerable variation and bias in IHI. We thus evaluated the characteristics, quality, and accuracy of IHI on PBT for PCa.

Methods and Materials

To emulate a patient searching the Internet, we undertook a qualitative research study using snowball-purposive sampling in which we evaluated the top 50 nonsponsored Google search results for "proton prostate cancer;" similar sampling strategies have been previously used to identify health-related websites (9). This sampling approach allowed for the evaluation of additional websites found to be referenced within the base study sample. The search was performed in a single session in March 2011. The results of a rereview of the final study sample in August 2012 suggested that most websites in our sample had not changed since their initial evaluation.

All 50 search results consisted of English-language websites. Two genitourinary radiation oncologists specializing in the treatment of PCa with PBT, x-ray therapy, and brachytherapy then independently evaluated each site over the same 5-day period. Raters were instructed to navigate domains freely and to add additional websites to the sample if they were frequently referenced in the initial sample. We excluded search results from the same domain (n = 4), those requiring a login (n = 7), nonfunctional URL (n = 1), and IHI not containing information on PBT for PCa (n = 10); 22 websites were excluded in total. Available websites for operational PBT centers in the United States were added to the sample (n = 6). Three additional websites were added to the initial sample using snowball sampling. Thirty-seven IHI websites were evaluated in the final sample (Appendix E1 and Appendix E2, available at www.redjournal.org).

Quality was evaluated on a 5-point scale using the validated 15-question DISCERN instrument (10). Reviewers discussed the definitions (10) of DISCERN questions during 2 sessions before rating the websites. An overall quality metric was assigned to each IHI source using a previously described algorithm based on the individual DISCERN ratings (11). Accuracy was evaluated by comparing IHI with the best available or contextual evidence. Websites were also evaluated for authorship, attribution, disclosures, and currency using a checklist known as the JAMA benchmarks (12).

Statistical analysis

Data were analyzed using Stata/IC 10.0 (Stata Corporation, College Station, TX) and MAXQDA 10 (VERBI Software, Marburg, Germany). Percent agreement was evaluated with Spearman's rho. Quality was compared with the Kruskal-Wallis 1-way analysis of variance with Bonferroni correction. $P < .05$ was considered statistically significant.

Results

As shown in Table 1, the websites in our sample most frequently were patient information/support resources (46%), were focused

Table 2 Evaluation of JAMA benchmarks (n = 37)

Characteristic	Yes (%)	No (%)
Authorship: "Authors and contributors, their affiliations, and relevant credentials should be provided"	16 (43)	21 (57)
Attribution: "References and sources for all content should be listed clearly, and all relevant copyright information noted"	13 (35)	24 (65)
Disclosure: "Web site 'ownership' should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest. This includes arrangements in which links to other sites are posted as a result of financial considerations. Similar standards should hold in discussion forums"	32 (86)	5 (14)
Currency: "Dates that content was posted and updated should be indicated"	22 (59)	15 (41)

Benchmark definitions adopted from Silberg et al (12).