Changes in Newspaper Coverage About Hormone Therapy with the Release of New Medical Evidence

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BACKGROUND: Results of 2 trials of postmenopausal hormone therapy (HT) challenged established practice patterns; 1 was not associated with changes in HT use, whereas the other was associated with substantial decline. Differential coverage by lay newspapers may have contributed to the differential impact.

OBJECTIVE: To examine newspaper coverage of HT before and after the publication of the Heart and Estrogen Replacement Study (HERS) in August 1998, and the main findings of the estrogen plus progestin therapy arm of the Women's Health Initiative (EPT-WHI) in July 2002.

DESIGN: Longitudinal review of newspaper articles, 1998 to 2003 ($n=663$).

SETTING: Twenty local and 6 regional/national newspapers.

MEASUREMENTS: Number and content of articles about HT.

RESULTS: The average number of articles about HT published during the month of the publication of the EPT-WHI was at least 8-fold greater than the number of articles published on the topic during any prior period. While the majority of articles in all periods presented information about the potential benefits of HT, information about harms became more common than information about benefits during the 2 months before the publication of the EPT-WHI, when the trial participants were notified of the early termination of the study. The presentation of specific health harms was more common after the publication of the EPT-WHI than after the publication of HERS. Few articles in any period used visual aids.

CONCLUSIONS: The publication of the EPT-WHI was associated with a change in both the volume and content of newspaper coverage about HT.

KEY WORDS: hormone therapy; lay media; drug usage.

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The findings of 2 trials of postmenopausal hormone therapy (HT)^{1,2} differed from those of prior observational studies and therefore challenged established practice patterns.³ In August 1998, the Heart and Estrogen Replacement Study (HERS) reported an excess risk of coronary artery dis-

ease associated with HT use among women with documented coronary artery disease.¹ In July 2002, the estrogen plus progestin therapy arm of the Women's Health Initiative (EPT-WHI) was stopped prematurely by its Data and Safety Monitoring Board (DSMB) because the risk of breast cancer and a global index summarizing the balance of harms and benefits supported harms exceeding benefits in a sample of healthy postmenopausal women randomized to HT use.² While the results of HERS were not associated with changes in HT use by postmenopausal women,⁴ the publication of the EPT-WHI was associated with rapid and substantial decline in utilization.⁴⁻⁶ Newspapers are an important source of information about the latest medical developments for the general population and health providers,^{7,8} and may be an important source of information for women in their decisions about HT. For example, in 1997, 49% of women cited newspapers and magazines as a major source of information to inform their decision about whether to use HT.⁹

This study was designed to examine the volume and content of newspaper coverage about HT before and after the publication of the HERS results and the EPT-WHI results. We hypothesized that not only did the volume of newspaper coverage increase with the publication of the EPT-WHI, but that the content of newspaper coverage changed as well. Specifically, we hypothesized that the publication of the EPT-WHI was associated with an increase in coverage of the harms associated with HT and a decline in coverage of the benefits. Finally, we hypothesized that newspaper coverage following the EPT-WHI was designed to draw the attention of women by including more front-page coverage, and that more quantitative assessments and visual aids would be included to help women to interpret these findings accurately.

METHODS

Data on Articles

We identified newspapers with circulations in 7 areas of the U.S. (Seattle [WA], San Francisco [CA], Vermont [VT], New

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Hampshire [NH], New Mexico [NM], Colorado [CO], and North Carolina [NC]). These areas participate in the Breast Cancer Surveillance Consortium (BCSC),¹⁰ which collects information about HT utilization for women who participate⁴ and reflects different regions of the United States. Local, regional, and national newspapers with circulation in these areas were identified. The local papers included the following: the *Albuquerque Journal*, (NM), *Albuquerque Tribune* (NM), *Santa Fe New Mexican* (NM), *Burlington Free Press* (VT), *Rutland Herald* (VT), *Times Argus* (VT), *Charlotte Observer* (NC), *Greensboro News and Record* (NC), *News and Observer* (NC), *Star News Wilmington* (NC), *Winston-Salem Journal* (NC), *Denver Post* (CO), *Rocky Mountain News* (CO), *Oakland Tribune* (CA), *San Francisco Chronicle* (CA), *San Francisco Examiner* (CA), *San Jose Mercury News* (CA), *Seattle Post-Intelligencer* (WA), *Seattle Times* (WA), and *Union Leader* (NH). The regional/national papers included the following: the *Boston Globe*, *Los Angeles Times*, *New York Times*, *USA Today*, *Wall Street Journal*, and *Washington Post*.

We used LexisNexis (Dayton, OH) to identify articles published from May to October in 1998, 2000, 2002, and 2003. We searched for news articles, editorials, letters to the editor, advice columns, and news summaries. Wire stories appearing in more than 1 newspaper were counted as separate articles each time they appeared. To focus on the most relevant articles for review, we selected months on both sides of the release dates for each of these years (the HERS and EPT-WHI articles were both published in the summer). The *Burlington Free Press* was not available on LexisNexis until January 1999, so no articles were available for this publication for 1998. Two of the papers (*Rutland Herald* and *Times Argus*) were not available on LexisNexis, so articles were found by searching their respective online archives. We included the following search terms hormone, hormone therapy, hormone replacement therapy, estrogen, progesterone, progestin, WHI, HERS, menopause, and menopausal. We reviewed full-text versions of the articles identified. We excluded 56 articles because they were about a health topic other than HT (e.g., a study about mammogram quality stating that use of HT increases breast density); the use of HT for prostate cancer treatment or sex change; the use of testosterone or birth control pills; or fluctuations in the stock prices of pharmaceutical companies.

Content Analysis

Coding variables were selected based on prior literature.^{11–13} We designed a coding instrument to capture specific frames including *increased harms* (defined as text that describe increased harm or adverse health results for women taking HT, or include scientific descriptions of harm such as increased risk for breast cancer, cardiovascular disease, or pulmonary embolism); *benefits* (defined as text that describes reduction in risk of disease including colon cancer and osteoporosis, hip fracture, or relief from menopausal symptoms); and *anger, fear, or uncertainty* (defined as comments from women, health care providers, organizational representatives, or others expressing anger, betrayal, fear, concern, or anxiety associated with HT use, the negative emotions of women, any mention, or acknowledgment of women's uncertainty influencing HT behavior). We defined *qualitative presentation* using words such as "more" or "increase," while *quantitative* was defined as using numbers or percents, as well as phrases such as "triple the

risk." *Specific health harms* related to HT included breast and endometrial cancer, heart disease, stroke, and blood clots. *Presentation of risk* was also divided into 4 mutually exclusive categories: no health risk information presented, qualitative only, quantitative only, and both qualitative and quantitative information. Photographs, drawings, illustrations, figures, diagrams, graphs, charts, and tables were considered to be *visual aids*. We also collected data on whether a *specific research study* (i.e., EPT-WHI or HERS), *physicians, scientists, or industry representatives* were cited. Finally, we compared the frames presented in headlines with the frames in the body of the article.

The articles were reviewed in NVivoTM, a qualitative data management program. Three reviewers completed a 1-day training session on the instrument and the coding process. Seventy articles were coded by at least 2 of the 3 reviewers to evaluate agreement, with each possible pairwise combination of coders reading the same 40 articles. The average κ 's and percent agreement's for the frames used in this analysis, the sources cited, and the types of specific harms mentioned ranged from 68% to 95%, with an average of 81% (percent agreement), and from 0.35 to 0.67, with an average of 0.48 (κ statistic). Because κ 's are influenced by the prevalence of the outcome, and some outcomes were rare, we calculated both measures. Measures of interrater reliability above 0.40 suggest good reproducibility.¹⁴

Data Analysis

The unit of analysis was individual newspaper articles. Articles were grouped into time periods based on the dates of publication of HERS and the EPT-WHI. Because HERS appeared in August of 1998, articles were grouped as follows: from May 1 to July 31, 1998 to represent coverage prior to HERS (i.e., "pre-HERS"); from August 1 to 31, 1998 to represent coverage during the month of publication; and from September 1 to October 31, 1998 to represent "immediate postHERS" coverage. Estrogen plus progestin therapy arm of the Women's Health Initiative was published in July 2002. Therefore, the corresponding time periods for EPT-WHI were May 1 to June 30, 2002, July 1 to 31, 2002, and August 1 to October 31, 2002. The articles from 2000 represented coverage between HERS and EPT-WHI. We used SAS 8.2 (Cary, NC) to calculate the means and frequency distributions and test for differences across the sampled periods.

RESULTS

Description of the Articles

Table 1 shows a distribution of the newspapers where the 663 articles appeared. Among the local newspapers from the BCSC sites, the urban locations had a greater percentage of the newspaper articles than the sites that included rural areas. A majority of articles appeared in the regional and national newspapers. Newspaper coverage of HT changed during the periods examined (Table 2). The median number of words per article was 605 (range from 53 to 5,677). On average, there were 8-fold more articles about HT published during the month of the publication of the EPT-WHI than during any of the preceding periods, increasing from an average of 19 articles per month prior to HERS to an average of 197 during the month of EPT-WHI publication. Although coverage about HT

Table 1. Distribution of Articles by Location of Local Newspapers and by National Newspapers that Report an HT Story (n=663)

	Percentage of Articles
Local newspaper sites	
Denver, CO	7.2
New Hampshire	0.6
New Mexico	3.8
North Carolina	13.1
San Francisco Bay area	10.8
Seattle, WA	10.9
Vermont	1.1
Subtotal local newspapers	47.5
Regional and national papers	
Boston Globe	4.5
Los Angeles Times	7.2
New York Times	14.5
Wall Street Journal	5.7
Washington Post	14.3
USA Today	6.3
Subtotal national and regional newspapers	52.5
Total	100

remained higher than it had been before the publication of the EPT-WHI results, HT coverage subsequently declined. In all periods, the majority (68% to 91%) of newspaper coverage was news articles; however, during the month that the EPT-WHI was published, there was a significant increase in the number of editorials and letters to the editor on this topic from 0% to 14% to 31% ($P<.001$). During the month that the EPT-WHI was published, there was an increase in the percentage of articles about HT that started on the front page from 11% to 24% to 40% ($P=.003$). Except for the month that HERS was published and in 2000, a staff writer wrote more articles than a wire service.

Frames Presented in the Newspaper Articles

The harms and benefits of HT were the most common frames presented in all of the time periods examined. Throughout the

study period, the majority of these articles (52% to 68%) presented information about the potential benefits of HT (Fig. 1). While many articles also presented information about the potential harms associated with using HT, in 1998, presentation of information about harm appeared less frequently than information about the benefits of HT. In contrast, the presentation of information about harms was more common than information about benefits in 2002.

In addition to presenting information about the harms and benefits of HT, articles contained other frames. During the 3 months before the publication of HERS, 21% of articles contained an anger, fear, or uncertainty frame. During the month of the publication of HERS, 32% of articles expressed these frames compared with the publication month of the EPT-WHI, when significantly more articles (60%) expressed these views ($P=.007$).

Headlines and Content of Articles

Because headlines are used to draw attention to an article, we examined whether the frame presented in the headline reflected the content of the body of the article. Frames presented in the headlines were consistently discussed in the body of the article. For example, when the headline reflected the benefits of HT, all of the articles discussed the benefits of HT. When the headline reflected the harms of HT, 98% of articles discussed harm in the body of the article. We specifically examined whether headlines were more likely to report "sensational" headlines (e.g., with frames like anger, fear, or uncertainty). When a headline reflected frames of anger, fear, or uncertainty, 93% of articles contained these frames, and when a headline reflected increased harms associated with HT, harm was discussed in 98% of the articles.

Presentation of Harm

Because both studies presented new evidence about the harms of HT, we specifically examined how information about

Table 2. Characteristics of Newspaper Articles about Hormone Therapy Published between 1998 and 2003

	May to July 1998	August 1998 Month of HERS Publication	September to October 1998	May to October 2000	May to June 2002	July 2002 Month of EPT-WHI Publication	August to October 2002	May to October 2003
Average number per month*	19.3	25.0	14.0	10.5	11.0	197.0	41.7	24.2
Percentage on the front page*	21.4	24.0	10.7	12.9	19.0	40.2	27.5	23.4
Percentage in a Sunday edition*	15.5	4.0	25.0	27.0	27.3	11.2	20.8	16.4
Type of article*								
News article (%)	72.4	84.0	85.7	90.5	86.4	67.5	81.6	81.4
Editorial (%)	1.7	0.0	0.0	1.6	9.1	13.2	4.0	2.1
Letter to the editor (%)	6.9	0.0	0.0	4.8	4.5	17.8	7.2	13.8
Other (%)†	19.0	16.0	14.3	3.2	0.0	1.5	7.2	2.8
Authorship*								
No first author/ byline (%)	7.4	13.0	0.0	14.8	6.7	8.0	4.8	5.6
No affiliation (%)	13.0	0.0	0.0	7.4	20.0	23.0	10.5	14.5
Staff writer (%)	35.2	26.1	56.0	14.8	26.7	45.4	41.0	46.0
Wire service (%)	20.4	43.5	16.0	33.3	20.0	12.6	29.5	25.0
Other affiliation (%)	24.1	17.4	28.0	29.6	26.7	10.9	14.3	8.9

* $P<.05$ across time periods.

†Includes advice columns and news summaries.

FIGURE 1. Percentage of articles containing frames about harms and benefits of hormone therapy.

$P < .05$ for trend in benefit information over time.

$P < .005$ for trend in risk information over time.

harms was presented (Table 3). With the publication of the EPT-WHI, newspaper articles were substantially more likely to mention specific health harms associated with HT. Although the majority of articles mentioned harm, most (50% to 75%) did not include any qualitative or quantitative assessment of the risk before the EPT-WHI, whereas, after the EPT-WHI, 67% conveyed some assessment of the magnitude of harm. Qualitative assessments were more common than quantitative assessments; less than 5% of articles presented a quantitative assessment of risk without also providing a qualitative assessment. Throughout the study period, <23% of articles used a visual aid of any sort. Photographs, drawings, and illustrations were used more commonly than figures, diagrams, graphs, charts, or tables.

Sources of Information

During the month that HERS was published, only 16% of articles cited the name of a specific study. In contrast, 51% of articles cited the name of a specific study in the month EPT-WHI was published. The sources of information cited in the

articles did not vary over time; 65% of articles cited medical, scientific, or health experts, including study authors, physicians, or scientists; 17% of articles cited information from a pharmaceutical industry representative.

DISCUSSION

This study demonstrates a substantial increase in the volume of newspaper articles about HT temporally related to the release of the main findings of the EPT-WHI. While presentation of the benefits of HT continued to appear in the majority of articles, frames of harm became more common than those of benefit in the 2 months before the publication of the EPT-WHI, corresponding to the notification of participants that the study had been halted by the DSMB and the presentation of the findings at national conferences. The release of the EPT-WHI was also temporally associated with an increase in front-page coverage of HT. While it was associated with an increase in the presentation of specific information about harm, most data about risk were presented qualitatively, perhaps contributing to less accurate interpretation of the findings by women.¹⁵

Table 3. Presentation of Risk in Newspaper Articles about Hormone Therapy

	May to July 1998	August 1998 Month of HERS Publication	September to October 1998	May to October 2000	May to June 2002	July 2002 Month of EPT-WHI Publication	August to October 2002	May to October 2003
Specific health harm mentioned (%)*	44.8	56.0	35.7	52.4	63.6	71.6	74.4	76.4
How risk was explained*								
% None	62.1	56.0	75.0	57.1	50.0	31.5	33.6	32.6
% Qualitatively	29.3	24.0	17.9	30.2	36.4	34.5	53.6	27.8
% Quantitatively	3.4	4.0	0.0	0.0	0.0	0.0	1.6	1.4
Both	5.2	16.0	7.1	12.7	13.6	34.0	11.2	38.2
Visual aid								
% None	77.6	68.0	71.4	76.2	63.6	79.7	77.6	80.7
% Photograph, drawing, or illustration	17.2	28.0	21.4	23.8	31.8	15.2	20.0	13.8
% Figure, diagram, graph, chart, or table	1.7	4.0	0.0	0.0	4.5	2.0	0.8	2.8
% Both	3.4	0.0	7.1	0.0	0.0	3.0	1.6	2.8

* $P < .0001$ for trend across time.

Most of these articles did not include a visual aid of any sort. Visual aids may help women incorporate information about harms and benefits.¹⁶ While there is an established interest in lay media coverage of the medical literature,^{15,17–23} little is known about how newspapers change their presentation about a health topic over time as new evidence or recommendations become available.^{18,21}

Why was there a more substantial increase in the number of newspaper articles about HT published during the month of publication of the EPT-WHI but not HERS? Prior work suggests that the lay media are generally hesitant to report new health recommendations, particularly on the basis of a single study. For example, a study of newspaper coverage of screening mammography in the 1990s found that newspaper coverage did not change to reflect new recommendations of national organizations.²⁴ While both HERS and EPT-WHI presented evidence that differed from established beliefs about HT, EPT-WHI was relevant to the majority of postmenopausal women, whereas HERS was relevant to the subgroup of those women with established cardiovascular disease. The EPT-WHI included a much larger sample of women than HERS. The premature stopping of EPT-WHI more than 3 years ahead of schedule, the early publication of the results, and the press conference likely drew more media attention. Press conferences and press releases are one mechanism for improving the accuracy and completeness with which findings are translated in lay newspapers.²² Because both HERS and the EPT-WHI were published in the same medical journal during the summer months, it is unlikely that differences in the impact of the journal or timing of publication contribute to the difference in newspaper coverage.^{1,2}

Beyond the presentation of harms and benefits, these newspaper articles covered a broad set of frames related to the use of HT, including anger, fear, and uncertainty. These issues are typically not assessed in the professional literature, yet may influence women's behavior. Our findings also suggest that the publication of the EPT-WHI was associated with a significant increase in editorials and letters to the editor about HT, indicating the importance of newspapers not only as a source of information about health care research findings but also as a forum for reflection, discussion, and advice.

Several specific suggestions have been made by physicians and researchers to promote the accuracy and quality of the coverage of medical findings by the lay media.^{15,17–23} Our work suggests that there is still room for improvement in newspaper coverage about HT in several dimensions. First, while there was a significant increase in the percentage of articles that included a specific qualitative or quantitative assessment of risks of HT following the publication of the EPT-WHI, one third of articles did not include this information, similar to findings from a decade earlier that looked at news media coverage for other health topics.¹⁸ Second, despite an increase in the presentation of a quantitative risk assessment during the month of publication of the EPT-WHI, few articles included this information. Third, few articles included a visual aid. Visual aids can promote the interpretation of harms and benefits, particularly among individuals with limited health literacy and numeracy.^{16,25} Finally, a minority of articles cited specific studies or sources, which are important to assess the credibility of a source who may have a financial interest or to seek further details.¹⁸ In contrast, these articles comply with prior suggestions to promote the accuracy of lay coverage of

medical findings by using headlines that reflect the content of the article.

While we demonstrate that the coverage of HT changed in magnitude and content with the publication of the main findings of the EPT-WHI, we did not directly address the impact of these articles on HT use by women. A small survey of women from North Carolina found that every woman reported having heard of the EPT-WHI study, and half reported that it had affected their use of HT.²⁶ Women cared for in a large health maintenance organization who reported that they had seen "good-quality" media reports about the EPT-WHI were more likely to attempt to discontinue HT.²⁷ Because we only collected newspaper articles, we could not examine lay coverage from other important sources such as television, radio, the internet, and popular magazines. While several recent studies have been limited to coverage in the written news media,^{24,28} women may be increasingly exposed to other types of media. Finally, our findings may not be generalizable to other regions.

These results suggest that newspaper coverage of the findings of the EPT-WHI and those of HERS were different, both in volume of coverage and in content. Further work should examine the effect of the lay media on the behavior of their audience, including the public, health professionals, and policy makers.

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