Drugs in the news: an analysis of Canadian newspaper coverage of new prescription drugs

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Abstract

Background: Patients routinely cite the media, after physicians and pharmacists, as a key source of information on new drugs, but there has been little research on the quality of drug information presented. We assessed newspaper descriptions of drug benefits and harms, the nature of the effects described and the presence or absence of other important information that can add context and balance to a report about a new drug.

Methods: We looked at newspaper coverage in the year 2000 of 5 prescription drugs launched in Canada between 1996 and 2001 that received a high degree of media attention: atorvastatin, celecoxib, donepezil, oseltamivir and raloxifene. We searched 24 of Canada's largest daily newspapers for articles reporting at least one benefit or harm of any of these 5 drugs. We recorded the benefits and harms reported and analyzed how such information was presented; we also determined whether clinical or surrogate outcomes were mentioned; if and how drug effects were quantified; whether contraindications, other treatment options and costs were mentioned; and whether any information on affiliations of quoted interviewees and potential conflicts of interest was presented.

Results: Our search yielded 193 articles reporting at least one benefit or harm for 1 of the 5 drugs. All of the articles mentioned at least one benefit, but 68% (132/193) made no mention of possible side effects or harms. Only 24% (120/510) of mentions of drug benefits and harms presented quantitative information. In 26% (31/120) of cases in which drug benefits and harms were quantified, the magnitude was presented only in relative terms, which can be misleading. Overall, 62% (119/193) of the articles gave no quantification of the benefits or harms. Thirty-seven (19%) of the 193 articles reported only surrogate benefits. Other information needed for informed drug-related decisions was often lacking: only 7 (4%) of the articles mentioned contraindications, 61 (32%) mentioned drug costs, 89 (46%) mentioned drug alternatives, and 30 (16%) mentioned nondrug treatment options (such as exercise or diet). Sixty-two percent (120/193) of the articles quoted at least one interviewee. After exclusion of industry and government spokespeople, for only 3% (5/164) of interviewees was there any mention of potential financial conflicts of interest. Twenty-six percent (15/57) of the articles discussing a study included information on study funding.

Interpretation: Our results raise concerns about the completeness and quality of media reporting about new medications.

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Canadians collectively spend more on prescription drugs each year than they spend on physician services,[1] and people are increasingly turning to the media for information about new drugs.[2] In a 1999 survey, 84% of Canadian doctors reported that they believed media reports influenced the kind of treatments their patients requested.[3] In addition, 58% of people surveyed by the US National Health Council in 1997 said they had been prompted to modify some aspect of their behaviour by a health-related story reported in the media.[4]

It is not only consumers who are influenced by the media. Although the extent to which cautious and well-informed health care professionals will be influenced by mainstream news reporting is arguable, recent research has shown that the cumulative effect of media reports, combined with other educational materials provided to physicians, can have an impact on prescribing practices.[4–7]

Canadian journalists have raised several concerns about the accuracy of pharmaceutical reporting, including the lack of formal policy guiding news coverage of "breakthrough" stories, the staging of press conferences by commercial interests and difficulty in obtaining independent information on pharmaceuticals (Mintzes B, Walker T. Survey of patient information and consumer education of prescription medicines. Consumer Education and Information Project. Unpublished report prepared for Federal/Provincial/Territorial Utilization Task Force, 1998).

Until now, no systematic studies shedding light on the quality of pharmaceutical reporting by the Canadian media have been published. In fact, to date, there has been only one systematic analysis of media coverage of the benefits and risks of medications, a 2000 Harvard University study

examining US print and television news reports on alendronate, pravastatin and acetylsalicylic acid.[8] The study reported here goes further, assessing not only the quantitative descriptions of drug effects, but the nature of the effects described (clinical or surrogate) and the presence or absence of other important information that can add context and balance to a report about a new drug.

Methods

From a list of never-before-released drugs with Canadian launch dates in the 5-year period 1996 to 2000, we selected, by consensus, 5 drugs (atorvastatin, celecoxib, donepezil, oseltamivir and raloxifene) representing diverse drug classes that, according to preliminary searches, had received sufficient coverage to permit quantification of benefits and harms. For the entire year 2000, we performed a key word search using the brand and generic names of the 5 drugs for 24 English and French Canadian daily newspapers with a weekday circulation greater than 50 000 (for details of the search strategy, see Appendix 1[9–12]). We included in our study all articles that discussed at least one beneficial or harmful effect of any of the study's 5 drugs.

Each article was stripped of its title, source, date and byline and was then assigned a study code. For each stripped article, 2 members of the research team manually, and independently of each other, reviewed the article's content to determine its suitability for inclusion in the study; a third member arbitrated any differences. Once the suitability of articles had been determined, each stripped article was independently coded by 2 members of the research team, and any discrepancies were arbitrated by a third team member. The following data were categorized and entered into our database.

- Mentions of drug benefits and harms (categorized as surrogate or clinical). Surrogate markers are not diseases in and of themselves; rather, they are changes in physiologic measurements that may be associated with an increased or decreased risk for future disease. For example, changes in cholesterol level, blood pressure or bone density are surrogate markers, whereas pain, shortness of breath, disability, heart attack and stroke are considered clinical endpoints. We believed that this distinction was important because changes in surrogate markers do not necessarily lead to changes in clinical endpoints that would be considered important to patients.
- Magnitude of drug benefits and harms (categorized as absolute or relative) and the time frame over which the effect occurred. Research has shown that patients and physicians preferentially choose medications according to whether the benefits are presented in relative or absolute terms.[13–15] If, for example, disease A occurs in 2 of every 100 people, the absolute risk of disease A is 2%. If taking drug X reduces the frequency to 1 in 100, there is an absolute risk reduction of 1%. Drug X could also be said to reduce the risk by 50%, because 1% is half of 2%. This 50% reduction is called a relative risk reduction. Absolute risk reduction is a less misleading account of the magnitude of a drug's benefit than relative risk reduction.
- If a specific study was mentioned, the study's design as well as

Table 1: Characteristics of newspaper articles describing 1 of 5 new drugs

Drug	No. (and %) of articles			
	Retrieved	Included in study*†	Mentioning at least one benefit‡	Mentioning at least one harm‡
Atorvastatin	75	17 (9)	17 (100)	11 (65)
Celecoxib	82	31 (16)	31 (100)	5 (16)
Donepezil	66	45 (23)	45 (100)	7 (16)
Oseltamivir	74	59 (31)	59 (100)	23 (39)
Raloxifene	59	41 (21)	41 (100)	15 (37)
Total	356	193 (100)	193 (100)	61 (32)

*Articles mentioning at least one benefit or one harm.
†Percentages calculated on the basis of all 193 articles included in the study.
‡Percentages calculated on the basis of articles included in the study for each particular drug.

Table 2: Benefits reported for the 5 drugs

Drug	No. of mentions of benefits	Type of benefit; no. (and %) of mentions of benefits			No. (and %) of articles mentioning only surrogate benefits*
		Clinical	Cost	Surrogate	
Atorvastatin	30	14 (47)	0	16 (53)	8/17 (47)
Celecoxib	58	49 (84)	2 (3)	7 (12)	7/31 (23)
Donepezil	96	82 (85)	6 (6)	8 (8)	2/45 (4)
Oseltamivir	158	124 (78)	5 (3)	29 (18)	4/59 (7)
Raloxifene	79	39 (49)	1 (1)	39 (49)	16/41 (39)
Total	421	308 (73)	14 (3)	99 (24)	37/193 (19)

*Denominators represent number of articles about each drug analyzed in this study.

the journal in which the study appeared or the meeting at which its findings were presented, and any details of the study, including the number and characteristics of study subjects and funding sources.
- The names of quoted interviewees and any disclosed financial affiliations.
- Any mention of drug indications, contraindications, costs, drug alternatives and nondrug alternatives (which might include herbal remedies or modifications of lifestyle or diet).

Results

A total of 356 articles mentioning at least 1 of the 5 study drugs appeared in 24 of Canada's largest newspapers in the year 2000. Of those articles, 193 (54%) discussed at least one harm or benefit and thus met our inclusion criteria. No article mentioned a harm without listing a benefit (Table 1).

Although every article contained at least one mention of a benefit, only 61 (32%) mentioned at least one harmful effect (Table 1). In the 193 articles, beneficial effects (421 in total; Table 2) were mentioned 4.7 more times than harmful effects (89 in total; Table 3) (see www.cmaj.ca for additional tables detailing the benefits and harms). The proportion of benefits versus risks mentioned per drug ranged from a high of 92% for celecoxib to 65% for atorvastatin.

For all drugs combined, 73% (308/421) of the benefits mentioned were classified as clinical (Table 2). The percentage of benefits classified as clinical differed among the drugs and was lowest for atorvastatin and raloxifene (47% and 49% respectively) (Table 2). Nineteen percent (37/193) of the articles reported only surrogate benefits.

Overall, 24% (100/421) of reports of benefits included a measure of the magnitude of the benefit (Table 4). When the magnitude of benefit was described, absolute numbers were provided in 70% of the 100 cases. Few articles included information on the time frame in which a benefit might be expected to occur, and only 4% (15/421) of mentions of benefit included both the absolute magnitude of the benefit and the time frame. Overall, 62% (119/193) of the articles did not quantify the benefits or harms.

In contrast to the number of surrogate benefits mentioned, only 2% (2/89) of the harmful effects were classified as surrogate (Table 3). Both of these surrogate measures of drug harm were the development of influenza viral strains resistant to oseltamivir.

Only 24% (21/89) of the harmful effects mentioned included a measure of the magnitude of such potential problems or side effects, but 95% of these (20/21) were described with absolute numbers (Table 4).

Seventy percent (136/193) of the articles stated one or more drug indications (Table 5). In contrast, only 4% (7/193) of the study articles made specific mention of contraindications. Forty-six percent (89/193) of the articles mentioned at least one other drug that could be used to treat the same illness. Lifestyle, diet and other alternative treatments were classified as "nondrug alternatives," and these alternatives were mentioned in 16% (30/193) of the articles.

The cost of the drug was mentioned in 32% (61/193) of the articles (Table 5). Costs were most likely to be mentioned in articles on donepezil (27/45 or 60%) and oseltamivir (29/59 or 49%). Donepezil's cost was most often discussed in the context of decisions by the Saskatchewan and Quebec provincial governments surrounding coverage of the cost of the drug.

Thirty percent (57/193) of the articles referred to the results of a specific study. Reporters provided some information on the study design in 63% (36/57) of the articles that mentioned a study. Thirty-five percent (20/57) of the articles discussing a study stated how many patients had been involved, and 26% (15/57) included information on study funding.

In total, 62% (120/193) of the articles quoted at least

Table 3: Harms reported for the 5 drugs

Drug	No. of mentions of harms	Type of harm; no. (and %) of mentions of harms	
		Clinical	Surrogate
Atorvastatin	15	15 (100)	0
Celecoxib	5	5 (100)	0
Donepezil	11	11 (100)	0
Oseltamivir	32	30 (94)	2 (6)
Raloxifene	26	26 (100)	0
Total	89	87 (98)	2 (2)

Table 4: Quantification of benefits and harms

Drug	No. of benefits/ harms	Type of data; no. (and %) of benefits or harms							
		Absolute		Relative		Both absolute and relative		No quantitative information	
		Benefits	Harms	Benefits	Harms	Benefits	Harms	Benefits	Harms
Atorvastatin	30/15	1 (3)	0	10 (33)	0	1 (3)	0	18 (60)	15 (100)
Celecoxib	58/5	4 (7)	1 (20)	3 (5)	0	1 (2)	1 (20)	50 (86)	3 (60)
Donepezil	96/11	17 (18)	0	0	0	0	0	79 (82)	11 (100)
Oseltamivir	158/32	42 (27)	17 (53)	14 (9)	1 (3)	2 (1)	1 (3)	100 (63)	13 (41)
Raloxifene	79/26	2 (3)	0	3 (4)	0	0	0	74 (94)	26 (100)
Total	421/89	66 (16)	18 (20)	30 (7)	1 (1)	4 (1)	2 (2)	321 (76)	68 (76)

one person, and the total number of spokespeople mentioned was 244 (average 2 per article). Excluding 31 industry and 49 government spokespeople (the latter because it is unlikely that they would have financial links to manufacturers), a financial link with the drug was mentioned for 3% (5/164) of interviewees.

Interpretation

In total, 68% of Canadian newspaper reports on the 5 drugs included in this study did not mention a single potential harmful effect, and benefits were mentioned nearly 5 times as often as harmful effects. In addition, the articles usually lacked quantitative information that would help a reader to know the likelihood that the drug would help them or the likelihood of adverse effects. Nineteen percent of articles described only surrogate benefits, and contraindications were mentioned in only 4%. Only one-third of articles mentioned the costs of the drugs.

The articles commonly included quotes from satisfied patients, researchers and clinicians but rarely stated whether these people had any financial links to the manufacturer. In addition, information on contraindications, costs, and drug or nondrug alternatives was often lacking.

In the only other comparable evaluation, 53% of US print and television reports (v. 68% in the current study) made no mention of potential harm.[8] In that study, 40% of reports did not quantify benefits; among reports that did quantify benefits, 83% mentioned only relative benefits. One possible reason for the difference between our study and that of Moynihan and associates[8] is that the earlier authors looked only at drugs used for prevention, whereas we looked at drugs for both treatment and prevention. However, the 2 studies were broadly consistent in finding an overall positive bias in the presentation of information on new drugs, with many reports failing to mention any harmful effects.

This study examined only the content of news reports on a sample of new drugs. We did not examine the information sources that journalists used or the extent to which they relied on press releases, press conferences or promotional materials provided or funded by manufacturers. Furthermore, we did not search for financial links between quoted interviewees and manufacturers. Although we excluded articles that did not have any discussion of a drug's health effects, we did not control for the overall intent or focus of articles. Therefore, some articles might have appropriately omitted certain information. It is also important to mention that we looked only for the presence or absence of information and did not examine the accuracy of claims about particular products.

This research could be bolstered by a more thorough examination of other media — especially television, radio and the Internet — to obtain a broader understanding of how all forms of media are reporting on new drugs.

The Canadian Newspaper Association holds itself to a high standard of journalistic integrity. In its statement of principles[16] the organization states that a "newspaper's primary obligation is fidelity to the public good" and that the newspaper should serve its readers "by presenting information that is accurate, fair, comprehensive, interesting and timely."

Schools of journalism should be encouraged by this research to invest more resources in training, and media outlets should be encouraged to allow sufficient time and space to report thoroughly on new drugs.

At a minimum, newspaper reports about a new drug should accurately portray the characteristics of the product and its potential role in treatment. To do so, the report must provide descriptions of the drug's harms and benefits, identify interviewees as accurately as possible, point out the quality of the research behind claims about the drug and include, if possible, information on contraindications, costs and alternatives. A good story about a new drug will leave the reader with a balanced assessment of where the drug fits within the spectrum of current clinical practice.

This article has been peer reviewed.

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Table 5: Mention of drug indications, contraindications, costs, drug alternatives and nondrug alternatives for the 5 drugs

		Type of information; no. (and %) of articles				
Drug	No. of articles	Indications	Contraindications	Costs	Drug alternatives	Nondrug alternatives
Atorvastatin	17	13 (76)	0 (0)	0 (0)	6 (35)	3 (18)
Celecoxib	31	18 (58)	1 (3)	4 (13)	12 (39)	4 (13)
Donepezil	45	38 (84)	2 (4)	27 (60)	11 (24)	3 (7)
Oseltamivir	59	40 (68)	4 (7)	29 (49)	39 (66)	7 (12)
Raloxifene	41	27 (66)	0 (0)	1 (2)	21 (51)	13 (32)
Overall	193	136 (70)	7 (4)	61 (32)	89 (46)	30 (16)

Competing interests: None declared.

Contributors: Alan Cassels, the principal investigator for this study, carried out the overall management, design and coordination of the project; oversaw the data coding, analysis and interpretation; and wrote the initial draft of the manuscript. Merrilee A. Hughes acted as a consultant on all issues pertaining to journalism. She contributed to the study design, conducted searches of newspaper databases, extracted information from newspaper articles, coded the data and contributed to manuscript editing. Carol Cole and Barbara Mintzes carried out data coding, arbitrated differences in coding and contributed to study design, analysis and data interpretation. In addition, Barbara Mintzes oversaw the analysis of articles published in French. Joel Lexchin contributed to the study design, analysis and interpretation of the data, and critical revisions of the manuscript; he also contributed important intellectual content to the manuscript. James McCormack contributed to the development of the coding instrument, constructed the study database, and led the extraction and interpretation of data from the study database; he also contributed important intellectual content to the manuscript.

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Appendix 1: Search strategy and coding methods for Canadian newspaper articles discussing new drugs

We conducted a content analysis of Canadian newspapers to investigate the quality of pharmaceutical drug information being communicated to the Canadian public. We selected the following 5 drugs, which represent diverse drug classes and which had Canadian launch dates in the 5-year period 1996 to 2000:

- atorvastatin (Lipitor), for treatment of high cholesterol levels, released March 1997
- celecoxib (Celebrex), cyclooxygenase-2 inhibitor for treatment of inflammation, released April 1999
- donepezil (Aricept), for treatment of Alzheimer's disease, released August 1997
- oseltamivir (Tamiflu), neuraminidase inhibitor for treatment of influenza, released January 2000
- raloxifene (Evista), selective estrogen receptor modulator for treatment of osteoporosis, released January 1999

We identified 24 of Canada's largest daily newspapers, with weekday circulations of greater than 50 000 (22 English and 2 French, from 6 provinces). Two additional French newspapers were excluded from our study because they were not included in any databases. Given the complex licensing agreements that Canadian newspapers have with database providers, it was necessary to search 4 separate databases to access the full text of all articles appearing in each of the selected newspapers. Fourteen of the newspapers were available through Infomart's *Special Edition*,[9] 3 were obtained through *Virtual News Library*,[10] 3 through *Eureka*[11] and 2 through *The Globe & Mail* database.[12]

A key word search of the 24 newspapers was performed with both the brand and generic names of the 5 drugs for the entire year 2000. Four members of the team (2 reviewers per article) manually reviewed the articles retrieved to determine their suitability for inclusion in the study. These manual reviewers, who had considerable experience in drug information research, were an epidemiologist (B.M.), a clinical nurse (C.C.), a medical journalist (M.A.H.) and a drug information specialist (A.C.). A third team member (J.M.), not involved in the manual reviews, arbitrated any differences in assessment of suitability (interrater reliability check). Articles with any reference to the benefits or risks of the 5 selected drugs were included, even if the article dealt predominantly with another topic. All types of newspaper stories were accepted, including briefs, business stories and "Dear Doctor" style articles.

A coding instrument was developed and pilot-tested to identify the benefits and risks cited within articles and their qualitative or quantitative descriptors. Each benefit and risk was classified as either clinical or surrogate, and magnitudes were further categorized as being presented in absolute or relative terms. Sources quoted and reports cited were recorded, along with any financial affiliations. Any mention of drug or nondrug alternatives to the drug of interest was recorded. Indications, contraindications and drug costs mentioned in the newspaper articles were also noted. Each of the articles included in the study was independently coded by 2 members of the research team, and any discrepancies were resolved by a third member (these functions were performed by A.C., M.A.H., B.M. and C.C.).