

Is Content of Medical Journals Related to Advertisements? Case-control Study

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Aim To assess the relatedness of journal content to paid advertisements published in the journal.

Methods The case-control study was performed on a convenience sample of 7 journals subscribed by Central Medical Library in Moscow – 4 international (*American Journal of Hypertension*, *British Journal of General Practice*, *The Lancet*, and *New England Journal of Medicine*) and 3 Russian peer reviewed journals (*Terapevticheskii Arkhiv*, *Khirurgiia*, and *Voeno-Meditsinskii Zhurnal*). In each issue containing a paid advertisement, classifieds excluded, we searched for articles related to the advertised product and compared this issue with a control issue – the next or a later issue without this advertisement.

Results In *American Journal of Hypertension* (33 issues from 2002-2004) 94 placements of advertisements were found, 7 of which were closely related to the article topic in the same issue (7/94) vs 2/66 in the control issue. The odds ratio (OR) and 95% confidence interval (CI) for advertisements to be accompanied by related articles was OR, 2.6; 95%CI, 0.5-13). In *British Journal of General Practice* (27 issues from 2003-2005) there were 7/63 advertisements related to the article topic vs 0/28 in the control issue (OR, 7.2; 95% CI, 1.3 to 44). In *The Lancet* (49 issues from 2004) there were 8/162 advertisements related to the article topic vs 8/104 in the control issue (OR, 0.6; 95% CI, 0.3-1.5). In *New England Journal of Medicine* (37 issues from 2004) there were 12/81 advertisements related to the article topic vs 8/75 in the control issue (OR, 1.5; 95% CI, 0.56-3.79). In *Terapevticheskii Arkhiv* (10 issues from 2004) there were 38/93 advertisements related to the article topic vs 1/83 in the control issue (OR, 56.66; 95% CI, 4.4-253). In *Khirurgiia* (25 issues from 2003-2005) there were 3/83 advertisements related to the article topic vs 0/70 in the control issue (OR, 2.7; 95% CI, 0.3-26). In *Voeno-Meditsinskii Zhurnal* (33 issues from 2003-2005) there were 17/31 advertisements related to the article topic vs 2/31 in the control issue (OR, 17.6; 95% CI, 3.6-87).

Conclusions The strong relatedness between the content of the articles and advertisements placed in 3 of 7 journals and explicit placement of the advertisements face to face or overleaf the related research articles support the hypothesis that journal content is manipulated to place more emphasis on the advertisements.

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With rare exceptions, the sustainability of paper journals depends on the revenue from advertisements, mostly from the pharmaceutical industry (1,2). Even in the best journals the revenue from advertisements is higher than revenues from subscription (2), the relations with industry are not completely benign (3,4), and advertisers influence the content of journals (5). At the periphery – in developing countries and in the majority of the less financially sustainable specialty journals, the practice of advertising often does not comply with international recommendations (6,7) or industry codes (8). I noticed that during recent years, advertisements in Russian medical journals have been accompanied by articles on the related subject, and many such articles appeared to be specially produced to reinforce the message in the advertisement. This is in agreement with occasional findings of other authors (2). The objective of this study was to find out whether the content of medical journals is related to the published advertisements.

Methods

The design of the study was a matched case-control study.

Data sources

We analyzed a convenience sample of 7 journals subscribed by the Central Medical Library in Moscow. There were 4 international journals – *American Journal of Hypertension*, *British Journal of General Practice*, *The Lancet*, and *New England Journal of Medicine* and three Russian peer reviewed journals – *Khirurgiia* (Moscow-Surgery), *Terapevticheskii Arkhiv* (Archive of Therapeutics), and *Voenna-Meditinskii Zhurnal* (Military Medical Journal), all indexed on MEDLINE. All the selected journals had different owners and publishers and a complete set of issues in pre-study period.

Data extraction

Each paper issue was searched for printed advertisements, except job and conference/courses advertisements and inserted materials known as advertisement “inserts.” After this, the content of the issue was searched for articles (original research and comments) related to the advertised product. The correspondence section was not searched. This search was repeated for each advertisement. The case was defined as a placement of the advertisement for the specific product. If more than one advertisement for a product was published in the same issue, they were considered as a single case. When one product was advertised using different designs, all designs were considered as an advertisement of the same product. When similar products (eg, different statins) were advertised in the same issue, publications were considered as different cases. Articles where the brand name or generic name of the specific product was mentioned or the theme of the publication was very close to the advertised product (eg, analysis of the specific group of drugs) were considered as closely related articles. If there were more closely related articles in the issue, they were considered as one article. A control was the next or a later issue without the advertisement of the product.

Statistical analysis

Statistical analysis was performed as for an unmatched case-control study, because there were no control issues for the last case issues in the set. Odds ratios (OR) and confidence intervals (CI) were calculated using the CIA software (<http://www.medschool.soton.ac.uk/cia/main.htm>).

Results

Our analysis showed that the journal content was often connected to advertisements (Ta-

Table 1. Number of advertisements and closely related publications in medical journals

Variable	Journal						
	American Journal of Hypertension	British Journal of General Practice	The Lancet	New England Journal of Medicine	Khirurgiia	Terapevticheskii Arkhiv	Voeno-Meditsinskii Zhurnal
Number of issues	33	27	49	37	25	10	33
Years	2002-2004	2003-2005	2004	2004	2003-2005	2004	2003-2005
Number of advertisement designs	20	16	23	15	18	68	27
Number of advertisers	9	16	10	11	10	32	24
Number of advertisement placements (cases)	94	63	162	81	83	93	31
Number of closely related articles	7	7	8	12	3	38	17
Number of controls	66	28	104	75	70	83	31
Number of closely related articles in control issues	2	0	8	8	0	1	2
OR (95% CI)	2.6 (0.5-13)	7.2 (1.3-44)*	0.6 (0.3-1.5)	1.5 (0.6-3.8)	2.7 (0.3-26)	33.5 (4.4- 253)	17.6 (3.6-87)
Number of advertisement placements per issue	3	2.3	3.3	2.13	3.32	9.3	0.94

*After exclusion of one advertisement that appeared in every issue.

ble 1). In all journals except one – *The Lancet* – the odds ratio (OR) was higher than one, indicating a connection between journal content and advertisements. In three journals the ORs were higher than 7 and statistically significant. Because this study was not blinded, and no parallel independent evaluations were done, OR may be biased, and ORs from 1 to 2 should better be ignored in the judgment in relation to specific journal regardless of their statistical significance.

Discussion

Statistical association between the subject of scientific articles and advertisements published in the same issue with this advertisement was clearly demonstrated in this sample of journals. This is a novel finding. Very strong association found in some of the journals is not the only proof of the manipulation of the journals' content. In a number of cases there was an explicit placement of advertisements on the facing page or overleaf the related research report. This observation also supports the hypothesis that journal content is used to emphasize the advertisement's message. The publication of research articles connected to advertisements contained no conflict of interest statement or funding disclosure which

may link them to the accompanying advertisements. The authors of these research reports usually gave only their academic affiliations. In Russian journals it is a new practice to publish affiliations – 15 years ago most journals did not regularly publish this information, and acknowledgment of funding sources and conflict of interests remains an exception.

The number of advertisements in medical journals is enormous, competing frequently with the professional medical content (2,9). The practice of arranging thematic items to accompany advertisements is usual for the commercial paper publications and on sponsored Web sites, but is considered unacceptable for peer reviewed journals. From the simple arrangements of the timely publications to support the advertisement there is just one small step to publishing articles prepared by advertisers. Such articles do exist (10,11), and if they are accepted for publication, it would be natural for an advertiser to use these articles to support the advertising message.

The reason why advertisers want to influence journal content is clear; readers trust the research reports published in professional journals more than other sources of information (12) and advertisers therefore want to get their products endorsed in the article (1). The reason for editors to adjust the content of the

journal to suit advertisers or to attract specific advertisements for a thematic issue is also clear; they hope to increase the advertising revenue and please advertisers (13). Editors and owners of journals are not naïve – they just balance the pros and cons – the profit from advertisements and the lost trust (3). At least some editors fully understand the danger of connecting the content of the journal with advertisements. The only journal in our sample with an odds ratio of less than one – *The Lancet* – has a specific policy to examine the content of every issue for possible relatedness with advertisements and to prevent coincided publications (14).

What can be done to prevent the use of the scientific content of the journals as support for advertisements? It is necessary to increase the pressure on journal editors to preserve their integrity. One way would be to further examine the association of advertisements with the content of journals. Although international advertising regulation (8) does not mention this practice, it is explicitly forbidden by the World Association of Medical Editors (WAME) document (15). The International Committee of Medical Journal Editors (ICMJE) also states: “The juxtaposition of editorial and advertising material on the same products or subjects should be avoided.... Advertising should not be sold on the condition that it will appear in the same issue as a particular article” (16).

Journals with the content manipulated by the interests of the advertisers should be excluded from the MEDLINE as commercial publications. The National Library of Medicine regulation on selection of journals for MEDLINE (17) states: “Neither the advertising content nor commercial sponsorship should raise questions about the objectivity of the published material [in the journal].” Readers should be taught not only critical evaluation of the journal articles using the tools of

evidence based medicine, but also critical use of advertisements (18) and recognition of possible bias introduced by the advertisements into the content of the journal. On the other hand, pressure must be exerted on authors. While “ghost writing” is difficult to prove, articles closely related to advertisements are simple to locate. The publication of “scientific articles” closely related to advertisements with hidden conflict of interest must be considered as serious misconduct.

Potential conflict of interest

The author was the Editor in Chief of the Mediasphera Publishing Group (Moscow), which publishes the journal *Khirurgiia* and is the Editor in Chief of the *Mezhdunarodnii Zhurnal Meditsinskoi Praktiki*, published by Mediasphera.

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