SHORT COMMUNICATION

Antibiotic drug advertising in medical journals

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Abstract
Advertising is a leading strategy for drug promotion. We analysed 779 advertisements in 24 medical journals, 25% of which featured antibiotics. Antibiotic advertisements showed differences compared to those of other drugs. None addressed the issue of antibiotic resistance. Efforts to prevent antibiotic resistance should take antibiotic advertising into consideration.

Introduction
Drug advertising in medical journals is a leading strategy of sales promotion [1]. Despite a growing body of literature on drug advertising, advertisements of specific drug classes have not been given much attention. Moreover, antibiotic advertisements have not yet been studied.

Material and methods
The first 3 issues (y 2000) of 24 leading medical journals, 6 from each speciality (family/internal medicine, paediatrics, obstetrics/gynaecology, surgery) were screened for advertisements (Table I). Advertisements were analysed with regard to design and content. Frequencies and means for antibiotic drug advertisements (ADA) and advertisements of other drugs (ODA) were compared using t-test, \( \chi^2 \), and 2-tailed Fisher’s exact tests, as appropriate. Odds ratios (OR) are presented for significant variables.

Results
In total, 779 advertisements were studied, 25% ADA and 75% ODA. The respective distribution according to journal speciality was: internal medicine 34% and 48% (\( p < 0.001 \), OR = 0.56); paediatrics 40% and 16% (\( p < 0.0001 \), OR = 3.5); surgery 13% and 9% (\( p = 0.14 \), OR = 1.48); and gynaecology 13.5% and 27% (\( p = 0.0001 \), OR = 0.42).

The mean advertisement size was 2.3 ± 1.1 pages and 2.5 ± 1.6 pages, respectively (\( p = 0.13 \)). ADA were less likely to feature biostatistical data or analyses (6.7% vs 11.5%, \( p < 0.05 \), OR = 0.56) or contain prescribing information (80% vs 86%, \( p < 0.05 \), OR = 0.65). There was no difference in the inclusion of tables and figures (13.9% vs 15.6%, \( p = 0.58 \)) or scientific references (56.2% vs 51.6%, \( p = 0.27 \)).

ADA were significantly more likely to contain a black background (18% vs 7%, \( p < 0.001 \), OR = 2.8). Pictures or graphics were included in 58% of ADA and 66% of ODA (\( p < 0.05 \), OR = 0.7). The most common pictures were of cartoons (23% vs 28%, \( p = 0.25 \)), the drug itself (21% vs 13%, \( p = 0.036 \), OR = 1.8), scientific material (18% vs 17%, \( p = 0.8 \)), and landscapes (10% vs 18%, \( p = 0.033 \), OR = 0.5). There was no difference in the depiction of flora and fauna.

Of ADA, 29% featured a human character compared to 45% of ODA (\( p < 0.0005 \), OR = 0.51). The mean number of humans, when featured, was 1.9 ± 1.5 and 2.2 ± 2.1 (not significant). Patients comprised 75% and 80% of such characters, while the rest were families (14% and 12%), doctors (7% and 3%), or doctors and patients together (4% and 5%); 32% and 34% were male (\( p = 0.74 \)) and the majority were Caucasians (75% and 73%, \( p = 0.7 \)).

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Humans in ADA were less likely to express happiness (54% vs 70%, \( p = 0.016 \), OR =0.49) and more likely to exhibit improvement after therapy (14% vs 2%, \( p < 0.005 \), OR =8.5).

The distribution of promotional messages is shown in Table II. ADA were more likely to present their product as one that ‘fights disease strongly’ and convenient for use and less likely as one that provides novel solutions.

None of the advertisements provided information regarding the association between antibiotic resistance and inappropriate antibiotic use.

**Discussion**

ADA and ODA differed with regard to many of the features studied. ADA were less likely to feature statistical data or prescribing information. Moreover, none addressed the risk of antibiotic resistance. The quality of information presented by manufacturers has long been debated and the methodological quality of drug advertisements was found to be unacceptably low [2]. This is perturbing, given that selective antibiotic pressure is by far the most important contributor to antibiotic resistance.

Of ADA, 40% were published in paediatric journals. This corresponds with the massive utilization of antibiotics in paediatric settings. Antibiotics are commonly prescribed for febrile illnesses in children, especially infants [3]. This paradigm of ‘a fever in a child must be treated with antibiotics’ originates from high incidence of infections in children, the difficulty in diagnosing infectious foci, and the risk of occult bacteraemia [4]. Thus antibiotic resistance has been increasing dramatically among paediatric pathogens (e.g. penicillin-resistant pneumococci [5]) which promoted a vicious circle of antibiotic prescribing. The increased representation of ADA in paediatric journals may show that drug manufacturers indeed focus on prescribing in paediatric settings.

ADA were more likely to contain a dark background and less likely to present pictures and human characters. When featured, humans were less likely...
to exhibit happiness but more likely to show improvement after therapy, and images of the drug itself were more commonly depicted. Moreover, an intimidating message regarding the ‘strength’ of the drug was the most common message. All the above corresponds to the notion that antibiotics are commonly prescribed when physicians are unconfident about the diagnosis. This advertising strategy addresses antibiotics as ‘drugs of (no)-choice’. Hence, antibiotics are perceived not only as beneficial, but also provide self (and sometimes false) reassurance to the physician.

In conclusion, some ADA urge clinicians to regard antibiotics as indispensable while creating a sense of danger with regard to the consequences of avoiding their use. In an era of multi-resistance, antibiotics should neither be regarded as ‘magic bullets’ nor be considered safe drugs in the global perspective. Public health efforts to prevent and control antibiotic resistant bacteria should undoubtedly address the issue of ADA. Further study is needed in order to assess the impact of advertising on antibiotic prescribing practices.

References