Publication of Abstracts Presented at 2001 NACCT

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ABSTRACT

Introduction: The timely and formal publication of material presented as abstracts at national meetings is critical to the dissemination of new information to the medical community. We designed a retrospective study to evaluate the publication rates of abstracts presented at a recent national toxicology conference. In addition, we attempted to determine whether readily identifiable characteristics could predict a greater likelihood of publication.

Methods: In June of 2004, we reviewed 237 abstracts from the 2001 North American Congress of Clinical Toxicology (NACCT). Abstracts were classified according to methodology and content. We then searched Medline, using PubMed, to determine the publication of each abstract.

Results: Fifty-seven of 237 abstracts (24.1%) were subsequently published in peer reviewed journals. There was no statistically significant difference in the rate of publication when abstracts were categorized with respect to methodology. When categorized with respect to content, abstracts related to natural toxins had a higher publication rate (41.2%; $p < 0.05$).

Conclusions: Three years after presenting abstracts at the 2001 NACCT meeting, the majority of abstracts remain unpublished. This is a lower rate than noted by other specialty medical societies.

INTRODUCTION

The timely and formal publication of material presented as abstracts at national meetings is critical to the dissemination of new information to the medical community. Without formal publication in peer reviewed medical journals, new scientific ideas remain inaccessible to most clinicians. Several studies, of various specialties, have described the publication rates of abstracts presented at national meetings. Publication rates ranged from 34% to 69% (Table 1) [1–5]. A study done by Gorman et al. in 1990 revealed a publication rate of 35.7% for 269 abstracts presented during the 1984 and 1986 North American Congress of Clinical Toxicology [6]. The publication rate of toxicology abstracts was lower than rates of publication for Cardiology, Surgery and Ambulatory Pediatric societies. We designed a retrospective study to revisit the issue of publication rates of abstracts presented at a recent national toxicology conference. Our hypothesis was that the

rate of publication for toxicology abstracts would be similar to those for other subspecialties. In addition, we attempted to determine whether or not readily identifiable characteristics could predict a greater likelihood of publication.

MATERIALS AND METHODS

In June of 2004, we retrospectively reviewed all 237 abstracts from the 2001 North American Conference of Clinical Toxicology (NACCT) that took place in Montreal. Abstracts were first classified according to methodology and content (Table 2 and Table 3 provide a description of the classification system). Two investigators independently classified each abstract. Where there was a disagreement on classification, the abstract in question was reread by both investigators in an attempt to reach a consensus. If a consensus could not be reached, the abstract was classified as "other."

Keywords: abstract, publication, rate, national, meetings

Notes: Abstract presented at NACCT 2004 meeting in Seattle. There was no outside funding of any kind used for this study.

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TABLE 1. Subsequent peer reviewed publication rates of abstracts presented at other medical meetings

Source	Year	% Abstracts Published
Otorhinolaryngological Research Society	1978–1995	69
United Kingdom national pediatric meetings	1996	63.6
Pediatric Academic Society	1998, 1999	44.6
American Academy of Orthopedic Surgeons	1996	34
American Academy of Gastrointestinal Endoscopy	1994	25

TABLE 2. Classification of abstracts by Methodology

Methodology	Description
Clinical Study	Any study involving human subjects in a clinical setting.
Basic Science	Any laboratory or animal research.
Case Report	A single or group of related clinical cases.
Other	Any abstract not fitting clearly into any of the above described categories or where agreement could not be reached between the two reviewers of the abstract.

We searched Medline using PubMed (<http://www.ncbi.nlm.nih.gov/> or www.pubmed.gov) to determine the publication of each abstract. We continued our search on PubMed by title, keywords, and by first, second, and last author. If a publication was not identified, we used a combination of these search terms. If a published paper corresponding to the abstract was not discovered using the PubMed search engine, we presumed that the abstract had remained unpublished. For all published papers, we recorded the journal of publication; we recorded the time (in months) it took for an abstract, presented at the Montreal meeting, to reach publication in the peer reviewed journal. Also, we determined if there were additions or deletions of any authors from an abstract, or whether there were any changes in an abstract's title or content.

The results were analyzed by the χ^2 test, using $p < 0.05$ as significant.

RESULTS

Of the 237 abstracts presented at the conference, 57 (24.1%) were subsequently published in peer reviewed journals. Publications appeared in the 25 journals (Table 4). The Journal of Toxicology-Clinical Toxicology published the highest number of abstracts, 17; Veterinary and Human Toxicology published 7 abstracts. The average time to publication was 15 months, and the range was 0 to

TABLE 3. Classification of abstracts by content

Content	Description
Drugs of Abuse	Abused substances, whether new or previously described.
Medication Errors	Incorrect administration of medication.
Natural Toxins	Plant and animal derived poisonings, including envenomations.
Environmental/Occupational	Exposure related to contamination of the environment or workplace.
Bioterrorism	Involving casualty management or prevention.
Suicide	Intentional overdose with the intent of self harm.
Other	Any abstract not fitting clearly into any of the above described categories or where agreement could not be reached between the two reviewers of the abstract.

29 months. There was no statistically significant difference in the rate of publication when abstracts were categorized with respect to methodology (Table 5). When categorized by content, only abstracts related to natural toxins had a significantly higher publication rate (41.2%; $p < 0.05$) (Table 6). 10 abstracts (17%) had substantial changes in conclusion; 12 abstracts (21%) had changes in title, and 25 abstracts (44%) had additions or deletions of authors.

DISCUSSION

Publishing final reports of abstracts presented at meetings in peer reviewed journals is important and cannot be overstated. National conferences provide a forum for the sharing and developing of preliminary data as well as the critiquing of ideas. However, in order to share ideas with the larger medical community, ideas must become published information in peer reviewed format and made accessible to the public. Publication in the final format provides greater details about the methodology and results, and it allows the authors to discuss the implications and the areas that need further study. If an abstract is deemed valuable enough to be presented at a national conference, it logically follows that the abstract should be published in a peer reviewed journal.

We have found that most abstracts presented at NACCT remain unpublished up to 3 years after their original presentation. Only 24.1% of abstracts originally presented at the Montreal conference appeared in a medical journal in the following 36 months. In comparison, the literature of other subspecialties reported an abstract publication rate that ranged from 25% to 69%, with a collective average of 47.24% [2–6].

Because abstracts provide limited information, it is understandable that many accepted abstracts are not ultimately published. It is possible that abstracts were not published because the author subsequently deemed the data as too trivial or otherwise

TABLE 4. Journals in which abstracts from the 2001 NACCT meeting were published

Journal	No. of Publications
Academic Emergency Medicine	2
American Industrial Hygiene Association Journal (AIHAJ)	1
American Journal of Emergency Medicine	3
Annals of Emergency Medicine	2
Annals of the New York Academy of Science	1
Annals of Pharmacotherapy	2
British Medical Journal	1
British Journal of Clinical Pharmacology	1
Critical Care Medicine	1
Critical Care	1
Emergency Medicine (Fermantle)	1
Emergency Medicine Journal	1
Journal of Academic Child and Adolescent Psychiatry	1
Journal of Emergency Medicine	3
Journal of Toxicology, Clinical Toxicology	17
Life Sciences	1
Medical Journal of Australia	1
Pediatric Emergency Care	2
Pharmacology and Toxicology	1
Pharmacotherapy	2
Przegl Lek	1
Quarterly Journal of Medicine	2
Toxicologic Sciences	1
Veterinary and Human Toxicology	7
Wilderness and Environmental Medicine	1
Total	57

inappropriate for publication. This may suggest that the abstract acceptance criteria at NACCT (and other meetings) are too liberal, though there are no specific standards to measure acceptance criteria. Alternatively, barriers to publication (such as workload, personal situations, or rejection for publication by journals) may have prevented the formal publication of an abstract.

We characterized abstracts by methodology and content to determine if either might predict the likelihood of publication. The methodology of an abstract appeared to have no influence on the likelihood of publication. Basic science, clinical studies, case reports, and those classified as other had similar rates of publication. Except for the natural toxins group, the content of an abstract did not correlate with a higher likelihood of publication. While it is possible that authors of natural toxin abstracts are more motivated to publish their work, perhaps publishers are

TABLE 5. Abstract publication rates by methodology

Methodology	No. of Abstracts	No. Published	% Published
Clinical Study	94	23	24.5
Case Report	109	25	22.9
Basic Science	19	6	31.6
Other	15	3	20.0
Total	237	57	24.1

TABLE 6. Abstract publication rates by content

Abstract Content	No. of Abstracts	No. Published	% Published
Drugs of Abuse	25	7	28.0
Medication Error	15	2	13.3
Natural Toxins	34	14	41.2*
Env. Exposures	29	4	13.8
Bioterrorism	5	1	20.0
Suicidal Ingestion	37	13	35.1
Other	92	16	17.4
Total	237	57	24.1

* *p*-value < 0.05

more willing to accept manuscripts related to this area of scientific research.

Not surprisingly, we found that abstracts frequently changed titles, conclusions, and authorship. Titles often changed to coincide with changes in conclusions, and authors were frequently added or removed from publications. For publications in which an abstract's conclusion or content substantially changed, it was difficult to determine whether the apparently similar publication was derived from the abstract or whether it represented a unique publication. An implication of our difficulty is that erroneous material may propagate in the literature. This may occur when a meeting abstract, published in the medical literature, is cited in a subsequent publication without noting the final details provided in the peer-reviewed paper, if it indeed was published.

One implication of the limited publication rate is that the abstract process may benefit from more standardized submission and acceptance criteria. For example, case reports should probably require the inclusion of a child's weight and age, or—if appropriate—objective documentation of a presumed exposure (e.g., tissue concentration). Statements of fact that form the basis of a research project should probably be referenced. Conclusions should be appropriate in scope and limited to data presented in an abstract. Applying such criteria, even if not strict, may have an impact on the number of acceptable abstracts; although, it would

probably enhance the reliability of those abstracts that remain unpublished in the peer review literature. Meeting organizers occasionally use an alternative approach and only select meeting abstracts that are made available in the accessible literature. The approach allows for the presentation of more abstracts than are publicly available at meetings.

LIMITATIONS

We did not ask authors if they were still in the process of attempting publication; we did not ask if publishers had rejected their manuscripts; and we did not ask for the actual acceptance date of the final, published paper. Furthermore, we did not directly contact authors regarding their personal barriers to publication. We did not separate abstracts based on domestic or international submission, and it is unclear whether there is a different standard of acceptance for the two.

While PubMed is a widely utilized and publicly available search engine, some final publications may have been excluded if they appeared in journals not indexed by Medline. While not directly related to this study, medical search engines such as Pub Med do not typically index abstracts from medical meetings. ToxNet (<http://toxnet.nlm.nih.gov>) does index some, including those from NACCT.

CONCLUSION

Three years after the 2001 NACCT meeting, the majority of abstracts remain unpublished. The publication rate of toxicology

abstracts is lower than other specialty medical societies, and it is less than those found in a similar study from a decade ago.

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