

## An observational study of the proceedings of the All India Ophthalmological Conference, 2000 and subsequent publication in indexed journals

Upreet Dhaliwal, MS; Rajeev Kumar, MSc

**Aims:** To determine the quality of reporting in the proceedings of the All India Ophthalmological Conference (AIOC) 2000, subsequent rate of publication in an indexed journal and differences between the proceedings and the journal version of these papers.

**Design:** Observational study.

**Materials and Methods:** All papers presented at the AIOC 2000 were retrieved from the proceedings and assessed for completeness of reporting. To determine the subsequent full publication, a Medline search was performed as of January 2007; consistency between the proceedings paper and the final publication was evaluated. Statistical analysis: Chi square and Fisher's exact tests were used to compare publication rates based on geographical location, subspecialty and study design; Student's *t*-test was used to compare differences based on the number of authors and sample size.

**Results:** Two hundred papers were retrieved; many failed to include study dates, design or statistical methods employed. Thirty-three (16.5%) papers were subsequently published in indexed journals by January 2007. The published version differed from the proceedings paper in 27 (81.8%) instances, mostly relating to changes in author name, number or sequence.

**Conclusions:** The overall quality of reporting of scientific papers in the proceedings of the AIOC 2000 was inadequate and many did not result in publication in an indexed journal. Differences between the published paper in journals and in proceedings were seen in several instances. Ophthalmologists should be cautious about using the information provided in conference proceedings in their ophthalmic practice.

**Key words:** All India ophthalmological conference proceedings, indexed journal, ophthalmology, publication rates

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Dissemination of research results are important in medical sciences, as they convey new information to the scientific community and focus on future research efforts.<sup>1-3</sup> Dissemination, traditionally, is achieved either by presentation of the results at a scientific meeting or publication in a scientific journal. Presentations are valuable as they rapidly provide new information. However, this data is not available to the entire scientific community unless it is published in an indexed journal. Although some societies publish conference proceedings, in general, the information included is insufficient to allow critical appraisal of the work.<sup>2</sup> Also, conference abstracts usually do not undergo rigorous peer-review prior to acceptance. Therefore, data found only in abstracts or proceedings may be misleading or inappropriate.<sup>4,5</sup> Studies have shown that results presented at scientific meetings may be different from the versions that appear later in peer-reviewed publications.<sup>6,7</sup> This can have serious implications, as scientists and clinicians who attend specialty annual conferences with a

view to learn more on the research front may use the research findings to make decisions about patient management.<sup>8</sup>

The All India Ophthalmological Society annual conference (AIOC) is the primary research conference of ophthalmology in India. Although acceptance of an abstract at a large scientific gathering such as the AIOC is prestigious, its publication of this research in a peer-reviewed journal that validates the significance of these data and methods.<sup>9</sup> In addition, the publication rate of presentations are claimed to be the indicator of the level of scientific quality of a meeting.<sup>10,11</sup>

We sought to determine the completeness of reporting of papers presented at the AIOC in the year 2000, the proportion that were ultimately published in peer-reviewed journals and differences between the presented paper and that published in a journal, if any.

### Materials and Methods

Using the proceedings of the AIOC, the full text of papers presented at the annual conference of the All India Ophthalmological Society in 2000 was obtained. The year 2000 was chosen to allow sufficient time for the presented papers to reach publication. Both authors independently assessed each proceedings paper for completeness of reporting that included the following key features: whether the authors provided adequate correspondence details, dates defining the

Departments of Ophthalmology (UD) and Biostatistics and Medical Informatics (RK), University College of Medical Sciences and GTB Hospital, New Delhi - 110 095, India

Correspondence to Dr. Upreet Dhaliwal, KH-6, New Kavinagar, Ghaziabad - 201 002, Uttar Pradesh, India. E-mail: upreetdhaliwal@yahoo.com

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period of study, objectives stated clearly enough to measure the outcomes, appropriate study design, appropriate statistical methods and adequate results. For randomized clinical trials (RCT) in addition to the features mentioned above, we assessed whether the authors provided details of the method of random allocation, sample size calculation and allocation concealment and masking. A score of 1 was given for each feature that was appropriately described; based on the features assessed, the maximum possible score varied with the study design. It was 5 for a descriptive paper, 6 for an observational or experimental study and 9 for a RCT. To make them comparable across the study designs, the scores were standardized by dividing the actual score by the maximum score possible for that study design and multiplying by 10. A score of 10 was taken to indicate a methodologically sound paper.

To determine if completeness of reporting had changed with time, papers of the proceedings of 2000 were compared with more recent proceedings (2006). For this purpose, 100 out of 264 papers were chosen from the proceedings of 2006. We settled on 100 papers instead of the whole 264 for several reasons. The primary outcome measure was completeness of reporting in the proceedings of 2000; review of papers for completeness of reporting was time consuming; 100 was a statistically valid number to compare with 200. To avoid bias of subspecialty, we included the first five papers of the first 20 subspecialties published in the proceedings of 2006.

To determine subsequent full publication, a detailed computerized search of articles indexed by *Index Medicus* was performed using the PubMed server as of January 2007. Therefore, the evaluation period extended for a maximum of 7 years. Appropriate key words from the title combined with each author's name were used in order to identify the corresponding publication. In case a hit was not obtained, the process was repeated with each author, groups of authors and finally with all authors. A published manuscript was considered to be a full publication of a proceedings paper when it satisfied both of the following criteria: (i) at least one of the authors of the proceedings paper was an author of the publication and (ii) at least one of the outcomes from the proceedings paper was an outcome of the publication.

The data were recorded independently by both authors. The type of journal (national or international; ophthalmological or other), month and year of publication, time lag to publication, number of authors, sample size, geographical location of the study, organization of origin (medical college or other), design of the study (descriptive, observational or experimental [RCT or non-RCT]) and subspecialty (as categorized in the proceedings) were noted. Both authors independently

recorded any differences between the proceedings paper and the published version with regard to sample size, analysis methods, results, number of authors and change in authorship sequence or names. The authors of this article were not masked to the authors and institutions. In case of discrepancy in the findings between the two authors, the results were discussed to determine the type of difference, if any. When it pertained to difference in the type of journal, month and year of publication, number of authors, sample size, geographical location and organization of origin of the study, completeness score, subspecialty and difference between the proceedings paper and the published version, the proceedings or the published paper was revisited and the discrepancy appropriately corrected. When it pertained to design of the study, the decision of the statistical author was final.

The data were entered into an Excel spreadsheet and the mean, standard deviation, and range for each category were determined. Univariate significance testing with the chi square test and Fisher's exact test was used to compare completeness of reporting in the Proceedings 2000 with that in Proceedings 2006 and to determine whether there were significant differences between papers with completeness scores of 10/10 and those with lower scores, in publication rates and study design. Univariate significance testing was also used to determine if there were significant differences in publication rates based on geographical location of the study, organization of origin, subspecialty and study design. To determine influence of geographical region of the study, study design, and subspecialty on subsequent publication in an indexed journal, we computed the *P*-value and odds ratio by comparing one category with all other categories combined, making a two-by-two contingency table.<sup>12</sup> One-way ANOVA with Tukey test was used to compare completeness scores based on geographical region and subspecialty. Student's *t*-test was used to determine differences in publication rates based on the number of authors and sample size and differences in completeness scores based on organization of origin.

## Results

The number of papers published in the Proceedings of the AIOC 2000 was 200; all were retrieved for the study. A large majority of studies failed to include the dates of the study, description of study design or statistical methods employed [Table 1]. In comparison, the Proceedings of 2006 showed significant improvement in reporting of objectives and study design, while correspondence details were less likely to be reported. Of the 200 papers in the Proceedings of 2000, 13 were RCT; none of these gave information on methods used

**Table 1: Completeness of reporting in the proceedings of 2000 compared with that in proceedings of 2006**

Studies that reported the following	2000 ( <i>n</i> = 200) <i>n</i> (%)	2006 ( <i>n</i> = 100) <i>n</i> (%)	Statistical comparison
Adequate correspondence details	160 (80.0)	67 (67)	0.01
Dates defining period of study	56 (28.0)	38 (38)	0.08
Objectives clearly stated	129 (64.5)	86 (86)	<i>P</i> < 0.001
Appropriate study design	71 (35.5)	49 (49)	0.02
Appropriate statistical methods*	16 (14.3)	11 (15.3)	0.85
Adequate results	193 (96.5)	94 (94)	0.32

\*Determined only for experimental studies (*n* = 112 in 2000; *n* = 72 in 2006)

**Table 2: Standardized completeness of reporting scores based on study design**

Study design	Standardized score Maximum score possible = 10			P-value (Tukey test)
	Range	Average (SD)	Median	
All designs	0-10	6.2 (1.92)	6.7	Observational: descriptive $P \leq 0.001$ ; rest comparable
Descriptive	2-10	5.9 (2.24)	6.0	
Observational	3.3-10	6.9 (2.00)	6.7	
Experimental	0-10	6.0 (1.69)	6.7	

**Table 3: Indexed journals in which 33\* proceedings papers were published**

Journal name	Number of papers
<b>National journals</b>	12
<i>Indian J Ophthalmol</i>	10
<i>Indian J Pathol Microbiol</i>	1
<i>J Indian Med Assoc</i>	1
<b>International journals</b>	22
<i>Ophthalmology</i>	5*
<i>J Cataract Refract Surg</i>	4
<i>J Pediatr Ophthalmol Strabismus</i>	3
<i>Ophthalmic Surg Lasers</i>	2
<i>Am J Ophthalmol</i>	2
<i>Arch Ophthalmol</i>	1
<i>J Glaucoma</i>	1
<i>Retina</i>	1
<i>Methods Find Exp Clin Pharmacol</i>	1
<i>Community Genet</i>	1
<i>Trop Doct</i>	1

\*One study was published in two journals, each reporting different aspects drawn from the proceedings paper

to generate the random allocation, calculate sample size or methods for allocation concealment and masking.

Scores for completeness are shown in Table 2; when the 13 RCTs were considered, scores were low and ranged between 3.3 and 6.7 (average  $4.9 \pm 0.97$ ). Only 14 (7%) papers scored 10 out of 10 points for completeness. These included five of all descriptive studies, seven of all observational and two of all experimental studies (12.5%, 14.6%, and 1.8%, respectively;  $P = 0.004$ ). Their publication rates were comparable with papers that had lower scores ( $P = 0.18$ ). Ninety-three papers originated from medical colleges and 107 from private centers. Completeness scores were comparable regardless of organization of origin ( $P = 0.21$ ). Papers from South India had significantly higher completeness scores than those from the West ( $P = 0.03$ ), all other regions being comparable. When subspecialty was considered, papers from the uvea session had significantly higher scores than those from refractive surgery ( $P = 0.03$ ), all other subspecialties being comparable.

Thirty-three (16.5%) of the papers published in Proceedings 2000 were subsequently published as 34 papers in journals indexed by *Index Medicus* by January 2007 (within 7 years of presentation; Table 3). Twelve papers were published in indexed national journals; 10 (83.3%) of them in an ophthalmic

**Table 4: Time period to publication of 34 papers\* in indexed journals after presentation at the conference in 2000**

Time period to publication after presentation at conference	Cumulative no (%)
Before conference	3 (9.1)
Within 12 months	10 (30.3)
Within 24 months	20 (58.8)
Within 36 months	30 (88.4)
Within 48 months	32 (94.1)
Within 60 months	33 (97.1)
Within 72 months	34 (100)

\*One study was published in two journals, each reporting different aspects drawn from the proceedings paper

journal. Twenty-two papers were published in indexed international journals (one study was published in two journals, each reporting different aspects); 19 (86.4%) were ophthalmic journals. Time from presentation to publication for 31 papers ranged from 2 to 77 months (average  $22.8 \pm 16.4$  months, median 20 months); the majority were published in the first 3 years of presentation [Table 4]. Three papers were published 1 month, 5 months, and 6 months before they were presented.

The number of authors in papers published in the proceedings varied from 1 to 9 (average  $3.5 \pm 1.7$ ); those that were not subsequently published in indexed journals had an average of  $3.4 \pm 1.6$  authors, while those that were published had  $4.1 \pm 1.8$  authors on an average ( $P = 0.02$ ). The sample size in papers published in the proceedings varied from 1 to 7733 (average  $219 \pm 736$ , median 60); those that were not subsequently published in indexed journals had an average sample size of  $214.3 \pm 774.3$ , while it was  $244.3 \pm 511.9$  in those that were published ( $P = 0.07$ ).

The majority of presentations at the conference were by authors from South and North India. However, geographical location did not influence the rate of subsequent publication in an indexed journal [Table 5]. Publication rate was not influenced by the organization of origin ( $P = 0.31$ ). Experimental studies were the most common study design but their publication rates were not significantly different from other study designs [Table 6]. Of the 13 RCTs, three (23.1%) were published as full papers. There was no difference in publication rates between RCTs and non-RCT experimental studies ( $P = 0.39$ ). Presentations dealing with glaucoma were significantly more likely to be subsequently published in an indexed journal [Table 7].

The published version differed from the proceedings paper in 27 (81.8%) instances. The types of differences are depicted in

**Table 5: Influence of geographical region of the study on subsequent publication in an indexed journal**

Region	Published in conference proceedings <i>n</i> = 200 (%)	Proportion subsequently published in indexed journal <i>n</i> (%)	<i>P</i> -value	Odds ratio (95% CI)
South India	80 (40.0)	16 (20.0)	0.28	1.52 (0.72-3.21)
North India	65 (32.5)	11 (16.9)	0.91	1.05 (0.47-2.31)
West India	32 (16.0)	2 (6.25)	0.09	0.30 (0.07-1.30)
East India	15 (7.5)	2 (13.3)	0.73	0.76 (0.16-3.56)
Central India	2 (1.0)	0 (0)	0.69	-
Foreign country	5 (2.5)	2 (40.0)	0.19	3.53 (0.57-21.98)
Not mentioned	1 (0.5)	0 (0)	0.84	-

**Table 6: Influence of study design on subsequent publication in an indexed journal**

Study design	Published in conference proceedings <i>n</i> (%)	Proportion subsequently published in indexed journals <i>n</i> (%)	<i>P</i> -value	Odds ratio (95% CI)
Experimental	112 (56.0)	16 (14.3)	0.34	0.70 (0.33-1.47)
Observational	48 (24.0)	9 (18.8)	0.63	1.23 (0.53-2.87)
Descriptive	40 (20.0)	8 (20)	0.51	1.35 (0.56-3.27)

**Table 7: Influence of subspecialty on subsequent publication in an indexed journal**

Subspecialty	Published in conference proceedings <i>n</i> (%)	Proportion subsequently published in indexed journals <i>n</i> (%)	<i>P</i> -value	Odds ratio (95% CI)
Cataract	33 (16.5)	6 (18.2)	0.78	1.15 (0.43-3.06)
Retina and vitreous	26 (13)	2 (7.7)	0.26	0.38 (0.09-1.71)
Glaucoma	21 (10.5)	8 (38.1)	0.01	3.79 (1.43-10.07)
Squint and neuro-ophthalmology	20 (10)	5 (25)	0.38	1.81 (0.61-5.38)
Uvea	13 (6.5)	2 (15.4)	1.00	0.92 (0.19-4.33)
Refractive surgery	10 (5)	0 (0)	0.16	-
Cornea	9 (4.5)	1 (11.1)	1.00	0.621 (0.08-5.14)
External diseases	9 (4.5)	2 (22.2)	0.65	1.48 (0.29-7.44)
Optics	6 (3)	0 (0)	0.33	-
Oculoplasty	7 (3.5)	0 (0)	0.49	-
Pediatric ophthalmology	16 (8)	3 (18.8)	0.73	1.19 (0.32-4.41)
Trauma	12 (6)	1 (8.3)	0.70	0.44 (0.06-3.56)
Miscellaneous	18 (9)	3 (16.7)	1.00	1.01 (0.28-3.72)

Table 8; they were mostly related to changes in author name, number or sequence.

## Discussion

A look at the abstract book of AIOC 2000 shows that 278 abstracts were submitted as free papers for the conference. That only 200 were published in the proceedings indicates that many authors either did not eventually present or did not submit a full version for the proceedings. Papers presented at scientific meetings have one important purpose: to disseminate research findings as soon as possible. However, medical scientists have questioned the quality of such presentations, as many are not reported in sufficient detail to enable judgments to be made

**Table 8: Ways in which the proceedings paper differed from the version published in an indexed journal (*n* = 27)**

Type of difference	<i>n</i> (%)
Sample size increased	7 (25.7)*
Sample size decreased	2 (7.4)
Results markedly different	1 (3.7)
Number of authors decreased	8 (29.6)
Number of authors increased	9 (33.3)
Change in authorship sequence	4 (14.8)
Change in author names	22 (81.4)

\*In three papers, the study period was longer than that described in the proceedings



about the validity of their results.<sup>4,13,14</sup> Our study too reveals that details of study design were available in only about one-third of the proceedings papers in the year 2000; even fewer experimental studies reported the statistical methods employed. Moreover, authors of RCTs omitted to mention the methods used to generate randomization, calculate sample size, allocation concealment, and masking. Thus, scientists desirous of duplicating the methodology in their own set-up would not have access to sufficient information. To compound the issue, correspondence details were missing from 20% of the studies, making it difficult for others to contact researchers for more information. The situation was not much better in the year 2006, when study design, though reported significantly more often, was still not available in half of the studies and correspondence details were missing from one-third.

When completeness scores were considered, only 7% papers scored 10/10; experimental studies, both RCTs and non-RCTs were significantly poorly reported. Poor reporting in the proceedings did not influence publication rates and was not related to organization of origin of the paper. Thus, it may simply have resulted from a casual attitude by the researchers towards the version published in the proceedings as opposed to the presented version of the paper. On the other hand, it may be a reflection of unsound methodology. Either way, these findings assume significance as practitioners may choose to alter their clinical practice based on results presented at scientific meetings.<sup>7</sup> Thus, researchers should interpret information presented at meetings with caution. Conference organizers could provide clearer guidelines, which outline the key elements that must be reported in all studies.

The subsequent rate of publication of papers presented at the AIOC 2000 (16.5%) was much lower than that reported by other specialty conferences (33-44.6%).<sup>1,7-9</sup> To avoid a temporal bias, we considered only those conferences for comparison, which had been conducted at about the same time (between 1998 and 2001) as the AIOC 2000. However, none of these 'other specialty' conferences were conducted in India. A Medline literature search did not reveal any article assessing publication rates of papers presented at conferences in India. Since publication rates may be influenced by geographical region of origin of the article, it may not be appropriate to compare publication rates across the globe.<sup>14-17</sup> Recent studies show that the publication rates continue to largely vary between 25 and 68%;<sup>17-20</sup> however, some specialty conferences report rates that are higher than 80%.<sup>21,22</sup> These authors conclude that high publication rates reflect well on the abstract selection process and the scientific quality of the meeting. Caution is advised when referencing or generalizing from abstracts that have not been published in full.

To improve the quality of meetings, scientific committees should be encouraged to be more selective.<sup>1,23</sup> However, since the number of papers submitted each year for presentation keeps increasing, it presumably makes the selection process more difficult.<sup>9</sup> Simultaneously, investigators should be encouraged to publish their data after presentation. It has been suggested that failure to publish an adequate account of a well-designed clinical trial is a form of scientific misconduct that can lead those caring for patients to make inappropriate treatment decisions.<sup>13</sup>

Though the AIOC publication rates were low, the time lag to publication was comparable to other studies; most were

published within the first 3 years of presentation, usually in a journal of the same specialty.<sup>1,7-10</sup> It has been suggested that presenters need help in submitting and publishing their work.<sup>10</sup> To that end, the Indian Journal of Ophthalmology, being the only national, indexed, ophthalmic journal, could offer further peer review and guidance to conference papers after presentation in an effort to encourage researchers to publish. More papers (nearly two-thirds) were subsequently published in international journals as opposed to Indian journals. Perhaps, impact factor of the journal prompted researchers to choose one journal over another. There are several specialty ophthalmic journals available in the international scenario as seen from Table 3. It is likely that researchers working in a particular specialty prefer to send their papers to a journal specializing in that topic. Finally, the prestige attached to an international publication may have influenced the choice of journal. These factors were not specifically studied and may form the basis for future research.

Though the difference in average number of authors between proceedings papers that were subsequently published and those that were not is only about half an author, it was statistically significant. The significance is possibly because of the large range (between 1 and 9 authors per paper). Other reports<sup>24</sup> have also found that papers with a larger author byline are significantly more likely to be published in an indexed journal. Presumably, having more authors on the byline ensures that one or the other carries the paper to full publication.

Subspecialties providing the largest number of abstracts have higher publication rates.<sup>25</sup> However, in the AIOC, although cataract and retinal subspecialties provided the largest volume of presentations, studies dealing with glaucoma were more likely to be published. We were unable to explain this discrepancy. Completeness of reporting was not deemed to be responsible as scores were comparable for all subspecialties except uvea, which had the most methodologically sound papers and refractive surgery, which had the worst. Perhaps, glaucoma research requires a more sophisticated set-up that might co-exist with an awareness or requirement for publication of research results. However, the same may be true for other specialties like retina or squint.

Authors report that randomized or controlled clinical trials are more likely to be published.<sup>12,25,26</sup> However, our study found that they were published at the same rate as non-RCT experimental studies. Since large clinical trials are the standard for making treatment decisions, the consequences of non-publication of the results of trials are significant; non-publication can lead to bias in the literature and contribute to inappropriate medical decisions.<sup>27</sup> Sample size was not predictive of publication in our study. Sample size was extremely variable, ranging between one case and several thousands, perhaps accounting for its lack of importance.

Researchers from South India had higher completeness of reporting scores than those from the West. However, geographical location did not affect publication rates. Perhaps, a larger sample size could bring out statistically significant geographical differences in publication rates. This study also highlights that there are geographical differences in the number of papers presented at the conference. This may in part be due to the fact that the conference was held in South India, but if confirmed, the All India Ophthalmological Society

could consider measures to rectify this regional disparity. Publication rates were not influenced by organization of origin. This probably is an indication that researchers in private institutions are under some pressure to publish, no different from researchers in medical colleges.

Differences between the paper presented at the AIOC 2000 and the version published in an indexed journal were found in more than 80% instances. This figure is much higher than that reported in other studies (18-59%).<sup>8,19,26</sup> However, the type of difference varies between studies. The most common discrepancy seen in our study was in the author byline, with 81.4% of papers having replaced one or more proceedings' authors with new ones. Other studies have shown that change in author names and number is not uncommon.<sup>8,26,28</sup> Such changes may result from pressure to grant gift authorship to persons in a position of relative power; persons who might otherwise cause conflict or mar the chances of presentation or publication.<sup>29</sup> On the other hand, it is possible that authors contribute to the presentation but not to the actual research and publication, or have moved on and are difficult to trace. It might be logical and helpful to apply the same authorship criteria to conference presentations as are required for indexed publications.<sup>30</sup> Though seen infrequently in our study, differences in study design, results and outcomes have been seen to occur in 10-19% of papers.<sup>25,31</sup> Such differences may result when investigators fail to review and carefully report their work at the time of abstract submission owing to the pressure of submission deadlines. Moreover, results may be poorly interpreted at the time of presentation. On the other hand, investigators tend to be more careful when submitting data for publication in peer-reviewed journals, while some changes in the data occur during the peer-review process due to editing by the editorial staff of journals.<sup>8</sup> Some changes between the presented and the published paper may result from audience feedback at the conference, which possibly helps improve the quality of the finished study.<sup>26</sup>

There were some limitations in the present study. It is possible that we missed articles published more than 7 years after the AIOC 2000. Moreover, we restricted our search to Medline-indexed journals and may have missed some articles published in journals that are not indexed in Medline. We did not specifically go into the reasons for conference presentations failing to get published in indexed journals. Other studies suggest that presented material may not be published, as investigators do not submit them for publication or because the work is not scientifically valid and may not meet the scrutiny of the peer-review process required for full publication.<sup>10,32</sup> One possible reason that scientists do not publish their presentation material in indexed journals is that they need the presentation only to be allowed to attend and be reimbursed for the conference. They may not be interested in doing anything further with the data after that. This speculation is supported by the fact that 278 abstracts were selected for presentation at the AIOC 2000, but only 200 were published in the proceedings.

While the proceedings are an appropriate measure to study, they are at best a surrogate for the presentations at the conference. Thus, the actual presentations may be totally different and may not be reflected in the print version that follows (proceedings and publications). However, since the actual presentation content is impossible to revisit at a later

date, it is the proceedings that other researchers will access; this makes it imperative that presenters give the same attention to the version they submit for the proceedings as they give to the presentation.

We conclude that the overall quality of reporting of scientific papers in the proceedings of the AIOC 2000 was inadequate and many did not go on to publication in an indexed journal. Differences between the published paper in a journal and in the proceedings were common. Ophthalmologists should be cautious about using information provided in conference proceedings in their ophthalmic practice.

Guidelines to scientific committees for more rigorous selection of abstracts could improve the reporting of studies and increase the publication rate. Researchers should be encouraged to publish their data. Future studies should look at barriers to the publication of research findings and identify ways to assist the publication process.

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