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Discrepancies Between Conference Abstracts And Full Publications In Ophthalmology Randomized Controlled Trials

Dr Suneel Narahari[1*], D Jothieswari[2], M S Riyazullah[3]

[1&*]Associate Professor, Deportment of Ophthalmology, Konaseema Institute of Medical Sciences & Research Foundation, Amalapuram, Andhra Pradesh, India.
[2&3] Sri Venkateswara College of Pharmacy, RVS Nagar, Chittor-517127, Andhra Pradesh, India.

ABSTRACT

Sometimes, information given in conference abstracts does not fully match the findings of the corresponding full-text report on a randomized controlled trial (RCT). At the same time, there is no clear link between the potential conflicts of authors and how often their RCTs are published. The purpose of this research was to (1) compare the main results presented in conference abstracts with what was published in journals and (2) find out if financial conflicts disclosed by authors during these trials affect the chances of publication. Researchers included abstracts from randomized controlled trials featured at annual ophthalmology conferences from 2001 to 2004. Through direct contact with researchers and searching digital databases, we found the first peer-reviewed article that summarized each abstract by November 2013. These differences were each put into two categories: qualitative, where the effect direction changed and quantitative, where the size of the effect changed. Conflicts of interest were grouped based on financial relationships, working for a company, serving as a consultant, holding intellectual property or receiving gifts from industry. RRs were calculated to examine if different types of conflict were associated with either publishing, not publishing or with results that could not be confirmed by statistical evidence. Of all the abstracts examined, 44.8% went on to be fully published. When 86 records reported the same main outcome at the same time, 47 (54.7%) of them had inconsistencies—7 were different in kind and the other 40 in amount. Discrepancies between the quantity measurements could not be labeled. They ranged from <10%, 10–20% and >20% in 14, 5, 14 and 7 cases, respectively. Reports of conflict of interest made by the lead author of a study were more likely to be published and did so faster (RR = 1.31; 95% CI = 1.04–1.64; log-rank p = 0.026). Having financial support (RR = 1.50; 95% CI = 1.19–1.90) or getting gifts (RR = 1.42; 95% CI = 1.05–1.92) strongly contributed to a paper's likelihood of being published, setting aside the statistical result. More than fifty percent of the matched abstract and publication pairs had differences in reporting main findings, suggesting the information in abstracts may not be accurate. We regularly observed that manuscripts from authors with conflicts of interest were more likely to be published, regardless of their outcomes.

Key words: Randomized Controlled Trials, Publication Bias, Conflicts of Interest, Data Discrepancy Ophthalmology Research

INTRODUCTION

News from RCTs at scientific meetings, as recorded in conference abstracts, regularly shapes the beliefs of experts, clinic staff and those who perform systematic reviews. A lack of trial reports makes it important for these summaries to directly affect doctors' choices in patient care [1–3]. In cases where full publications cannot be obtained, reviewers may decide to use the data extracted from abstracts, as advised [4–7]. On the other hand, the reliability of RCT data you find in abstracts isn't always guaranteed. Most abstracts have not been carefully reviewed by other researchers, may include partial or unfinished outcomes and usually do not contain enough information to properly judge the research plan [8]. Research from before points out that information provided in abstracts may be different from what is found in other publications [9, 10]. A specific analysis in this field revealed that in many cases, primary outcomes noted in abstracts had not received their proper designation in main clinical trial registries [11]. In other branches such as orthopaedics, cardiology, paediatrics, paediatric surgery and infectious diseases, 40-60% of abstracts and full papers reproducing the results of one RCT display differences. The number and types of inconsistencies seen in ophthalmology are mostly unexplored. Besides, abstracts might present results that are still ongoing or have finished [17] and it can be difficult to find out if the trial is over. Some researchers have found that some abstract presenters do not always conclude with a complete publication [18]. Recently conducted studies published in medicine can look very different from those that stay as abstracts. Abstracts showing statistically significant or favourable results are usually accepted for publication more frequently in peer-reviewed journals [19–21]. It has been found through studies that receiving financial support from industry can increase the chance of getting a paper published [20] and among studies that are published, industry support is linked to results that favour the experimental drug [22–25]. Still, there is uncertainty about how investigators'

COIs influence whether a study is published. A COI exists when personal gains might influence a professional's decisions over things such as patient safety or the truth in research [26, 27].

Study Aims
This study was designed to first evaluate how similar RCT results are in the abstracts and the full publications and second, to see if the reported conflicts of interest influence the publication of the results from abstracts.

METHODS

Abstract Selection
RCT outcome results from abstracts presented at vision science annual meetings in 2001 to 2004 were included in the study. Abstracts were published in print for 2001, but from 2002 to 2004, they were distributed on CD-ROMs. Abstracts eligible for the study were those that reported RCTs of treatments for any clinical condition or of interventions on healthy participants.

Data Extracting Process
Each abstract and its associated publication were examined by two people working independently. We took from the studies the author groups, how studies were conducted, who took part which interventions and comparator groups were involved and every reported outcome. The group always discussed and agreed on any disagreements in understanding.

Checking if the experimental data are significant
Data were always extracted from each abstract and publication by looking at the final outcome which was defined in the table above. Analysis was judged to have a statistically significant difference when the p-value was below 0.05 for any comparison or the results suggested an effect was significant at that point. When the results did not show any differences or when these were unclear for the same reasons as above, the outcome was classified as "not analyzed" or "not reported." As incomplete reporting is often an issue in abstracts, we analyzed what the statistical significance means for likely publication using five possible scenarios. In cases where results were missing, we considered them significant with zero, 25, 50, 75 or 100% certainty and selected results randomly using the runiform function in STATA® for assignments 2 through 4.

Mistakes were sorted into two groups:
• Disagreement occurs when the property or importance of the outcome in the report is not consistent with what was found or reported such as stating that something is (or isn't) significant but then not confirming that in the actual results.
• Agreement on direction, but not on the biggest effect: Different estimates for the same outcome in different studies.
This was figured out by:

Statistical Evaluation
We determined how widespread each kind of discrepancy was by counting the number of cases that showed them. We first used a log-binomial regression model to calculate the RR of publishing as related to COIs reported by the authors. The researchers built a second model to check if statistical significance changed the relationship between COIs and publication likelihood. The two types of terms included in the model were (1) if statistical significance was written about and (2) if the reported value reached statistical significance. Both Monte Carlo simulation models were run for every first author, last author and all authors listed, with results shown for each type of COI. To plot time-to-publication, Kaplan-Meier curves were made to view the growing probability of receiving publication over time (every month). The log-rank test was used to compare results between groups. Any abstract published before the start of the conference was considered a 1-month pre-event publication.

RESULTS

Table 1.Characteristics, main outcome results (overall and by whether or not the randomized controlled trial (RCT) described in the abstract was published), and the association with publication of the abstracts of RCTs presented at the Association for Research in Vision and Ophthalmology (ARVO) conferences during the years 2001–2004

Characteristics	All abstracts (N = 513)	Abstracts of unpublished RCTs (N = 283)	Abstracts of published RCTs (N = 230)	Relative risks (RR) (95 % CI)
	n (%**)	n (%**)	n (%**)	
Characteristics of the RCTs				
Funding				
Not reported	220 (42.9)	130 (45.9)	90 (39.1)	

Reported	293 (57.1)	153 (54.1)	140 (60.9)	
At least one funding source	170 (58.0)	80 (52.3)	90 (64.3)	1.28 (1.05–1.55)
Industry (pharmaceutical or other)*	65 (22.2)	25 (16.3)	40 (28.6)	1.40 (1.08–1.81)
Government*	75 (25.6)	30 (19.6)	45 (32.1)	1.32 (1.06–1.66)
Other*	55 (18.8)	25 (16.3)	30 (21.4)	1.12 (0.85–1.49)
No funding	123 (42.0)	73 (47.7)	50 (35.7)	0.74 (0.57–0.98)
Number of centers				
Not reported	370 (72.1)	210 (74.2)	160 (69.6)	Ref
Reported	143 (27.9)	73 (25.8)	70 (30.4)	1.18 (0.96–1.44)
Single center	50 (35.0)	28 (38.4)	22 (31.4)	Ref
Multicenter	93 (65.0)	45 (61.6)	48 (68.6)	1.72 (1.10–2.68)
Presentation at ARVO				
Poster	400 (78.0)	240 (84.8)	160 (69.6)	Ref
Oral	113 (22.0)	43 (15.2)	70 (30.4)	1.30 (1.06–1.61)
Main outcome results				
Main outcome - Statistical significance				
Not reported	270 (52.6)	185 (65.4)	85 (37.0)	Ref
Reported	243 (47.4)	98 (34.6)	145 (63.0)	1.48 (1.23–1.78)
Not statistically significant	115 (47.3)	48 (49.0)	67 (46.2)	Ref
Statistically significant	128 (52.7)	50 (51.0)	78 (53.8)	1.02

Figure 1: Factors associated with publication of randomized controlled trials (N=513)

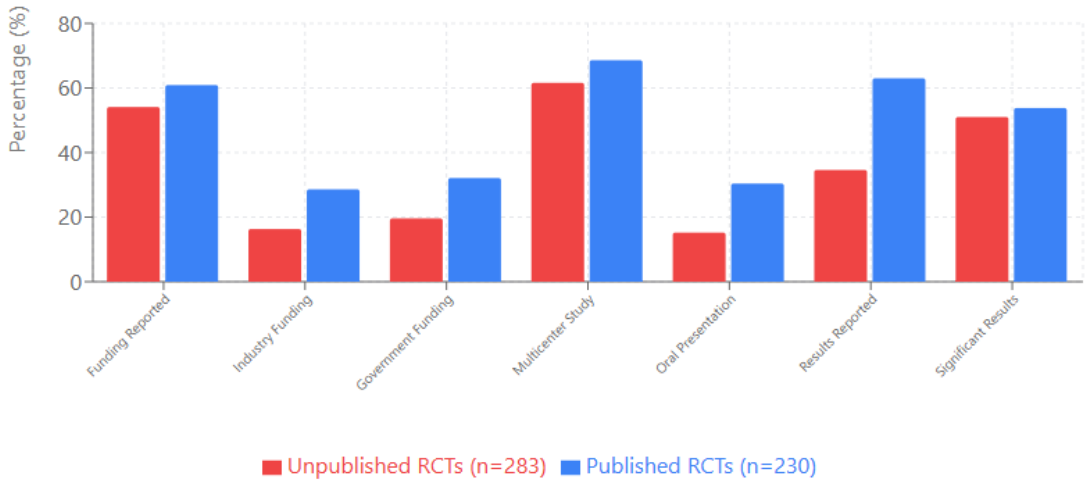

Table 1 summarizes the differences observed between published and non-published randomized controlled trials (RCTs) based on information in ARVO conference abstracts from the years 2001 to 2004. The analysis of abstracts showed that fully 57.1% reported their funding sources, while published RCTs listed them more often at 60.9%, not as frequently as unpublished ones, at 54.1%. The risk of publication for abstracts reporting a funding source was higher than for those without one, with a RR of 1.28 (95% CI: 1.05–1.55). Overall, 22.2% of abstracts mentioned industrial support and this percentage raised from 16.3% in unpublished work to 28.6% in published trials, with a relative risk of 1.40 (1.08–1.81). Similarly, government funding was higher in published abstracts, with 32.1%, compared to 19.6% in unpublished results (RR=1.32, 95% CI: 1.06-1.66). Alternatively, trials with no reported funding were less likely to be published (RR=0.74; 95% CI: 0.57–0.98).

Among all the abstracts, 27.9% included information about the number of centers involved. The chance of a multicenter study being published was about 72% higher than a single-center study (RR=1.72; 95% CI: 1.10–2.68). Publication was more likely for studies presented orally than for those shown as posters (RR=1.30; 95% CI: 1.06–1.61). Reporting statistical significance in the primary outcome study was associated with a journal article being published. Those abstracts that reported a statistical result were more likely to be accepted for publication (RR=1.48; 95% CI: 1.23–1.78) than those that did not provide statistical data. Still, among the groups that reported significance, the amount by which significant results had a higher number of publications was tiny (RR=1.02).

DISCUSSION

A total of 230 out of 513 (44.8%) of the abstracts describing RCTs that were reviewed in this analysis were ultimately published. In 55% of the matched abstract-publication pairs reporting the same main outcome at the same time point, we found either quantitative or qualitative differences in the reported results. Abstracts where the first author provided information about a conflict of interest (COI) were 31% more likely to be accepted for publishing and did so sooner, even if the key result in the study was not statistically significant.

How reliable are Abstracts?
How abstract results and publisher results are different is concerning, as numerous fields have encountered this issue. We saw similar patterns to previous research, showing that up to two-thirds of published abstracts and their linked papers have differences in different fields. Specifically, 8.1% of pairs did not agree when reporting the same outcome, demonstrating that out of about twelve clinical conclusions made using abstracts, about one might be altered with the full publication. Almost half of the comparisons had statistical differences in the size of effects which, even when small in one trial, could impact the findings of a meta-analysis. Strikingly, in less than one fifth of the cases studied, data initially in the abstracts was improved in later publications. In view of these differences, reviewers should be careful when reviewing summaries and do the necessary sensitivity analyses. If the abstract and the publication data don't agree, reaching out to study authors is recommended. Discrepancies in the way analyses are presented from abstracts to final publications occur and are documented in ARVO abstracts.

Solutions to Reduce Disagreements
It is important for scientists to establish ways of figuring out which results are still preliminary. For instance, platforms for abstract submission could let authors indicate preliminary results so readers are notified when new updates are available. In addition, authors need to inform journals about any conference presentation they have made and present the related abstracts to both reviewers and editors.

Few abstracts were published each year.
Despite following patients for a longer time, our findings still report a lower publication rate than different reviews have shown. As a result, many authors may not feel committed to complete manuscripts because ARVO supports both works in progress and a high number of accepted abstracts. Many junior investigators attend conferences only after submitting an abstract; these abstracts can function as learning tools rather than as reports of completed work. Yet, a small number of full RCT publications means researchers miss out and could be acting unethically, because RCT findings matter a lot to science and patient decisions.

Effect of Outcomes of Conflicts of Interest on Publishing
According to surveys done previously, many investigators in biomedical research are supported by industry funding, offered gifts or have other industry ties. The link between COIs and publishing is difficult because money might affect whether good or bad findings are released. Our review separated COIs from study funding because the latter was not always reported. Remarkably, first authors disclosed COIs in ways that last authors did not and this difference led to higher publication counts among the first authors. Reasons for this may be differences in sharing clinical data, resources for writing manuscripts or companies trying to influence leading authors. In addition, rather than first and middle authorship, being a last author may be more common among academics with other priorities. Those junior researchers mainly interested in conference presentations might not focus on getting full papers published, though our study didn't clarify this clearly.

CONCLUSION

The research indicates that the findings from randomized controlled trials described in conference abstracts are not always the same as those found in the matched full articles in ophthalmology. Just over a quarter of the matched abstracts progress to full publication, while more than half present some form of difference, showing that using abstracts to guide clinical decisions is unreliable. Abstracts reporting that at least one of the lead authors had a conflict of interest were significantly more likely to be published, irrespective of whether their results showed statistical significance. These results highlight that one should consider data from abstracts to be only preliminary, because they might differ in the final report. To fix this issue, we must highlight when abstract results are preliminary and demand that all prior speaking at conferences is disclosed with each manuscript entry. Also, the slow rate at which some research teams publish RCT findings suggests that important science findings could be overlooked which may harm both medical choices and ethical standards. Accordingly, the study demonstrates that sharing trial results in full in a

timely and accurate manner is vital and advises that work should continue to overcome and reduce any conflicts in biomedical studies.

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