ORIGINAL ARTICLE

From presentation to publication: the natural history of orthopaedic abstracts in the United Kingdom

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Background: Up to 63% of the chapters in major orthopaedic textbooks use the results from abstracts that have been presented at international orthopaedic meetings.

Methods: Orthopaedic abstracts were reviewed that were presented at the 1997 and 1998 meetings of the British Orthopaedic Association and other specialist orthopaedic meetings. The number of abstracts that had gone on to a full text publication was assessed and changes in study design or outcome were determined.

Results: Of the 415 abstracts 137 (33.0%) went on to full text publication. Abstracts presented at the British Orthopaedic Association were significantly more likely to go on to full text publication than abstracts from the other meetings studied. The mean time to publication was 15.6 months. Sample sizes in unpublished studies were smaller (mean 129.8 subjects compared with a mean of 191.4 subjects for published studies). Of full text papers, 19.0% differed regarding study design from the abstract presented at the initial meeting and 10.9% had published different results. Randomised controlled trials had the highest rate of later full text publication (53.6%) followed by observational studies (32.8%), basic science studies (31.4%), and case reports (6.7%).

Conclusions: In comparison with a study from North America, similar numbers of abstracts presented at meetings finally became published as full text articles, the abstracts had fewer authors, more often included randomised controlled trials and follow up data, and had fewer changes to the results. It is questionable whether the inclusion of such results from abstracts presented at international meetings by major orthopaedic textbooks should be undertaken before full text publication.

Bhandari *et al* state that the results from abstracts presented at international meetings are used in up to 63% of the chapters in major orthopaedic textbooks (including *Campbell's Operative Orthopaedics* and *Rockwood and Green's Fracture in Adults*). With this in mind, it is therefore, of considerable interest that of all abstracts presented at the 63rd annual meeting of the American Academy of Orthopaedic Surgeons only 34% were later published as a full text article with a mean time to publication of 17.6 months. Of abstracts that went on to full text publication 14% had changed their primary outcome measure and 19% published different results from their initial abstract.¹

The aim of this paper was to apply similar methodology to abstracts resulting from both general orthopaedic meetings (British Orthopaedic Association) and three specialised meetings in the United Kingdom.

METHODS

Using *Orthopaedic Proceedings* published by the British edition of the *Journal of Bone and Joint Surgery* we obtained the texts of all abstracts presented at the 1997 and 1998 meetings of the British Orthopaedic Association and of specialised meetings (British Association for Surgery of the Knee (BASK), British Orthopaedic Foot Surgical Society (BOFSS), and the 1997 meeting of the British Elbow and Shoulder Society (BESS)).^{2–8} The 1997 and 1998 meetings were chosen to allow sufficient time for the abstracts to reach publication.

Using similar methodology as described by Bhandari *et al*, we analysed 415 abstracts.¹ Premedline, Medline, and PubMed searches were conducted by two of the authors working together. The search was conducted using the names of the first, second, and third authors. If multiple publications were identified a Boolean operator (AND) was used to combine the names of the authors. Derived abstracts were

reviewed and compared with those published in the *Orthopaedic Proceedings*.

We noted the following: publication date, time lag to publication, number of authors, geographical location of the study, study type, sample number, subspecialty, and design of the study. If the abstract had gone on to full publication we also recorded differences between the presented abstract and the full text version with regard to primary objectives and hypothesis, study design (randomised controlled trial, observational, case report, or basic science), outcome measure, sample number, analysis methods and results, author number, and time in months between presentation and full text publication. Any differences noted in study results between the abstract and the full text publication constituted an inconsistency.

All data was entered onto an Excel spreadsheet and the mean, standard deviation, range, and median for each category was derived.

RESULTS

Publication rate

Of the 415 abstracts published in the 1997 and 1998 proceedings for the BOA, BASK, BOFSS, and BESS, 137 (33.0%) went on to full text publication (table 1).

Abstracts presented at the British Orthopaedic Association meetings were more likely to go on to full text publication (106 of 300; 35.3%; table 2) when compared with those presented at the more specialised meetings (31 of 115; 27.0%, $p < 0.05$; table 2).

Time lag to publication

The mean (SD) time to publication for all abstracts overall was 15.6 (11.14) months (median 14 months, range –7 to 56 months; fig 1).

Table 1 Abstract characteristics of general and specialised orthopaedic meetings

	Abstract followed by full text publication	
	Yes (137/415)	No (278/415)
Mean sample size (median and range)	191.4 (50.5, 1–4201)	129.8 (46.0, 1–3017)
Mean (SD) author number	3.1 (1.31) (range 1–7)	3.3 (1.36) (range 1–9)
Subspecialty		
Hand	8/16	8/16
Oncology	8/17	9/17
Hip	32/82	50/82
Elbow	5/14	9/14
Foot	26/80	54/80
Basic science	18/58	40/58
Shoulder	6/20	14/20
Spine	9/32	23/32
Knee	25/94	69/94

The mean (SD) time to publication for the BOA full text articles was 16.2 (6.1) months (median 14 months, range –7 to 56 months), for the specialist papers (BASK, BESS, BOFSS) the mean was 15.3 (9.3) months (median 14 months, range 1 to 48 months; table 2). There is no significant difference in the time lag for publication if the abstract is presented at a specialist meeting or at the BOA meeting ($p>0.05$).

Number of authors

The full text publications studied had a mean number of 3.1 (1.31) authors, and a mean sample size of 191.4 subjects (median 50.5, range 1 to 4201; table 1). Those that did not go on to full text publication had a mean of 3.3 (1.36) authors and a mean sample size of 129.8 subjects (median 46.0, range 1 to 3017). There was no significant difference in the number of authors between BOA and more specialist meeting papers that went on to full text publication ($p>0.05$).

Origin of papers

Of the published articles 127 of 137 (92.7%) were submitted from the European Union, with smaller numbers from Australasia (7 of 137, 5.1%), North America (2 of 137, 1.5%), and Asia (one 137, 0.7%).

Study type

Observational studies were the most common study design (302 of 415, 72.7%), followed by basic science papers (70 of 415, 16.9%). Randomised controlled trials made up only 28 of 415 (6.7%) of the presented abstracts but were the most likely study design to be published as a full text article (15 of 28, 53.6%). Observational and basic science studies had a similar publication rate (99 of 302, 32.8% and 22 of 70, 31.4%), whereas, case reports had the lowest publication rate of (1 of 15, 6.7%).

Abstract compared with specialty

The specialty with the most abstract presentations concerned the knee, but this was also the least probable to be published

as a full text journal article (25 of 94, 26.6%; table 1). Conversely abstracts concerning the hand were one of the least commonly presented abstract but the most probable to be published (8 of 16, 50.0%).

Follow up

It was interesting to note in the discussion by Bhandari *et al* that few of the North American abstracts commented on follow up.¹ This was not the case with the UK meetings where 72% of abstracts commented on the follow up period and percentage follow up.

Changes in study design

Of full text papers 26 of 137 (19.0%) differed in one or more aspects of study design or authorship when compared with the presented abstract. Abstracts presented at the BOA were twice as likely to have inconsistencies at the time of full text publication compared with those published after specialised meetings (table 2). In total there were 74 inconsistencies found in the 137 full text published abstracts (table 3).

The most common change was in sample number (28 of 137, 20.4%) and was commonly found in those papers with a long time lag between presentation and publication. These papers were also the most likely to have a change in the authors (22 of 137, 16.1%). Importantly, 15 of 137 (10.9%) full text papers published results that differed from the abstract.

DISCUSSION

Data from UK meetings

This study showed that a full text publication follows 33.0% of presentations at major meetings in the UK. The generally low publication rate may reflect a disparity between criteria for presentation and publication. An alternative explanation could be that, having achieved publication with an abstract, authors find it difficult to undertake the extra work required to achieve a full text publication. Help from experienced researchers may help more inexperienced staff obtain a higher publication rate.

Table 2 Comparison of British Orthopaedic Association abstracts published as full text articles compared with specialist meetings/associations

	British Orthopaedic Association	Specialist meetings/associations
Number (%) published as full text articles	106/300 (35.3)	31/115 (27.0)
Percentage of full text papers with inconsistencies	23/106 (21.7)	3/31 (9.7)
Mean time to publication (months)	16.2	15.3

Figure 1 Time to publication in months from abstract presented for both general and specialised orthopaedic meetings (negative values show papers published before presentation of abstract).

We found it surprising that the publication rate after presentation at the BOA was higher (35.3%) than at specialised meetings (27.0%). This may reflect differing selection criteria for presentation and for later publication between the two groups.

Many full text publications differed from the initial abstract; clearly some studies require additional work after presentation to achieve a publishable standard. Feedback from the audience at presentation undoubtedly helps improve the quality of the finished product and may contribute to authors changing their studies.

The time lag between publication of an abstract and publication of a full text article was long (15.6 months). This probably reflects both the time needed for preparation of the manuscript and for the editorial process after submission. Few authors published a full text article before presentation at a major meeting. Specialist registrars ought to take this lag into account in planning for yearly training assessments (RITA) and job applications.

Our study confirms that most orthopaedic papers are generated by small teams (typically a consultant and one or more junior members of staff). Randomised controlled trials are more work intensive and less often undertaken but have a higher chance of publication (53.6%) than observational studies (32.8%), basic science studies (31.4%), and case reports (6.7%).

Comparison of UK and North American data

This study showed that a full text publication after a presentation at a major meeting occurs at a similar rate in the UK and North America (33% and 34%). In comparison

with data from North America publications from the UK tended to have fewer authors (three compared with four), more often concerned randomised controlled trials (10.9% compared with 4.4%), and had a higher rate of inclusion of follow up data (72% compared with 41%). No significant difference was found in comparing the frequency of changes in sample size (20% and 18%) but authors in the UK tended to make fewer changes regarding the results of the study (10.9% and 19%).

CONCLUSION

In the paper by Bhandari and colleagues they state that the results from abstracts presented at international meetings are used in up to 63% of the chapters in major orthopaedic textbooks (including *Campbell's Operative Orthopaedics* and *Rockwood and Green's Fracture in Adults*).¹ Consistent with their paper, results from our own study found that only a third of such abstracts finally became published as full text papers and almost one fifth differed from their initial abstract. In addition, as more doctors undertake research to compete for national training numbers, the standard of work presented may diminish. This has important implications in the referencing of such abstracts before full text publication by major orthopaedic textbooks. Of further interest, these results illustrate that the time lag in producing full text publications should be considered when planning job applications and yearly training assessments.

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Table 3 Consistency of data and study design between published full text articles and initial abstract

	Total number	Percentage of full text articles
Objectives	0/137	0
Design	2/137	1.5
Outcome	3/137	2.2
Sample number	28/137	20.4
Analysis	4/137	2.9
Results	15/137	10.9
Authorship	22/137	16.1

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