



Original article

Publication rate of abstracts presented at the Congress of the European Federation of National Associations of Orthopaedics and Traumatology (EFORT)



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ABSTRACT

Background: The publication rate of presented abstracts is an important parameter to assess the scientific quality of medical congresses. It has been investigated for many congresses in orthopaedics and traumatology, but until now, it has not been studied for the congress of the European Federation of National Associations of Orthopaedics and Traumatology (EFORT). The aims of this study were to determine: (1) the publication rate of the EFORT congress, (2) factors that favour publication of abstracts presented at the EFORT congress, (3) the consistency between the congress abstract and publication in relation to authorship.

Hypothesis: There are factors that favour publication of abstracts presented at the EFORT congress and there is a high consistency between the congress abstract and publication in relation to authorship.

Materials and methods: All 1624 abstracts presented at the EFORT congress in 2011 were included in this study, to allow a 5-year period for publication after the congress. The characteristics of the abstracts presented were studied and the publication rate in peer-reviewed journals was determined using a Medline search.

Results: The publication rate for studies presented at the 2011 EFORT congress was 42% (677/1624 abstracts), with a mean of 16 months (– 56 to 60 months) between congress and publication. The mean impact factor of the publications was 1.8 (0–7.6). A significantly higher publication rate was found for: oral presentations (52%; 322/617) versus posters (35%; 355/1007) ($p < 0.01$), experimental studies (53%; 110/208) versus clinical studies (40%; 507/1254) ($p < 0.01$), and studies with higher levels of evidence of I or II (59%; 144/244) versus studies with lower levels of evidence of III or IV (36%; 362/1005) ($p < 0.01$). A new author was added in 59% (403/677) of the publications.

Discussion: Factors that favour publication of abstracts presented at the EFORT congress are oral presentation, experimental study, and a study with a higher level of evidence of I or II. It is common that a new author is added in the publication. Nevertheless, a high percentage of congress abstracts (58%; 947/1624) remains unpublished.

Level of evidence: IV, retrospective study.

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1. Introduction

One of the major aspects of research is the sharing of scientific results by means of publication [1]. The two most common types of scientific publication are presentation at a conference and

publication in a journal. Manuscripts submitted for publication in a peer-reviewed journal usually provide detailed information and thus enable reviewers to assess the quality of the research. Publication in a peer-reviewed journal is therefore regarded as the gold standard for presenting research to a wide audience [2–5]. In contrast, submissions to congresses are abstracts that provide limited information for reviewers. Caution may therefore be warranted when citing congress abstracts [2,3,6–8]. Nevertheless, congress abstracts may provide information about the latest research and

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may influence clinical practice due to faster publication times [6]. Congress abstracts are a part of gray literature and can be an important resource in systematic reviews [9]. Medical societies should therefore place a strong emphasis on ensuring the quality of presentations at their conferences. The rate of full papers for congress abstracts that pass the more extensive review process of a scientific journal and reach publication – the publication rate – is a common and widely accepted parameter for determining the quality of a congress [2–8,10–13]. It is notable that more than 90% of published congress abstracts achieve publication within 4 years after the congress [5].

The European Federation of National Associations of Orthopaedics and Traumatology (EFORT) organises a conference, which is one of the largest conferences in the field of orthopaedics and traumatology in the world. The publication rate for the EFORT congress has only been assessed for abstracts presented in the trauma sessions or related to hip surgery [8,11]. The publication rate for all abstracts presented at the EFORT congress has not so far been investigated.

The aims of this study were to determine: 1) the publication rate of the EFORT congress, 2) factors that favour publication of abstracts presented at the EFORT congress, 3) the consistency between the congress abstract and publication in relation to authorship. We hypothesized that there are factors that favour publication of abstracts presented at the EFORT congress and there is a high consistency between the congress abstract and publication in relation to authorship.

2. Materials and methods

2.1. Material

It is established practice to use a follow-up period of 5 years when searching for a publication associated with a congress abstract [2–6,10,12,14]. The most recent conference available to allow a follow-up period of 5 years was the EFORT congress held in June 2011. All 1624 abstracts (617 oral presentations, 1007 posters) were obtained from a library provided on the Internet by EFORT.

2.2. Method

A PubMed search (in the Medline database) was carried out by the second author from 07/01/2016 to 12/31/2016 for each congress abstract in order to identify a matching peer-reviewed publication. Publications up to 5 years before and after the conference were taken into consideration. The search algorithm used in PubMed was originally described by Bhandari et al. and is based on the names of the authors [6]. For each author of the abstract was searched separately in PubMed. Keywords from the title of the abstract were added in case of multiple publications per author. This methodology has also been used in several other studies [3–6,8,10,11,14]. Congress abstract and possible publication were compared in terms of the similarity of the study hypothesis, methods, sample size and results.

2.3. Methods of assessment

The time between congress and publication, the name of the journal and the impact factor of the journal in the year of the publication were noted. Consistency between the congress abstract and the publication was assessed in relation to the authors, first author, sample size and main result.

Characteristics of all the congress abstracts were classified in order to identify positive predictive factors for subsequent publication. The presentation form (oral presentation or poster) and type of study (experimental, clinical, epidemiological, review, case

report) were assessed. Clinical studies were classified as therapeutic, prognostic, diagnostic or economic. The level of evidence was determined for clinical studies in accordance with Marx et al. [15]. The design of the study (retrospective or prospective), randomisation, significance of the main result, number of study centres and anatomic location were assessed. The number of authors, gender of the first author and country of the first author were recorded.

2.4. Statistics

A spreadsheet was created and analysed using IBM SPSS Statistics for Windows, version 22.0 (IBM Corporation, Armonk, New York, USA). Descriptive analysis was carried out. The chi-squared test was used to compare categorical variables in the study groups. Odds ratios (OR) were calculated with 95% confidence intervals (CI). Differences were considered significant at $p < 0.05$.

3. Results

The publication rate for the EFORT congress in 2011 was 41.7%, with full papers being published for 677 of 1624 abstracts. The mean time between congress and publication was 16.3 months (–56–60 months). A total of 105 abstracts (15.5% of all publications; 105/677) were published before presentation at the congress. The publication rate over time and the number of publications per month are shown in Fig. 1.

Publications were found in 164 different peer-reviewed journals. A list of all journals that accepted 10 or more of the congress abstracts for publication is presented in Table 1. The mean impact factor for all publications was 1.77 (0–7.60). In addition, 16.2% (110/677) of the publications did not receive an impact factor, leaving a mean 2.11 (0.16–7.60) impact factor for the publications that received an impact factor.

The Table 2 shows publication rates relative to different characteristics of the congress abstracts. Oral presentations, at 52.2% (322/617), showed a significantly higher publication rate than posters, at 35.3% (355/1007) ($p < 0.01$; OR 2.01; 95% CI: 1.64–2.46). The most frequent types of study were experimental ($n = 208$) and clinical studies ($n = 1254$). A significantly higher publication rate was found for experimental studies, at 52.9% (110/208), in comparison with clinical studies, at 40.4% (507/1254) ($p < 0.01$; OR 1.65; 95% CI: 1.23–2.22).

Therapeutic studies represented the highest percentage of all clinical studies, at 78.8% ($n = 988$). No significant differences were found between the publication rates of the different types of clinical study (therapeutic, prognostic, diagnostic, or economic) ($p = 0.34$). Clinical studies with a higher level of evidence (I or II) showed a significantly higher publication rate, at 59.0% (144/244), than studies with a lower level of evidence (III or IV), at 36.0% (362/1005) ($p < 0.01$; OR 2.56; 95% CI: 1.92–3.40).

Significantly, higher publication rates were found for: randomised studies, at 55.1% (49/89), versus non-randomised studies, at 39.3% (458/1165) ($p < 0.01$; OR 1.89; 95% CI: 1.23–2.92); prospective studies, at 54.7% (205/375), versus retrospective studies, at 35.0% (323/922) ($p < 0.01$; OR 2.24; 95% CI: 1.75–2.86); studies reporting a significant main result, at 58.6% (300/512), versus those without, at 38.2% (65/170) ($p < 0.01$; OR 2.29; 95% CI: 1.60–3.26); and multicentre studies, at 58.6% (51/87), versus single-centre studies, at 40.7% (626/1537) ($p < 0.01$; OR 2.06; 95% CI: 1.33–3.20).

The publication rate for abstracts investigating different anatomic locations ranged from 37.7% (40/106) for foot and ankle to 50.0% (14/28) for pelvis (Table 2). No significant differences were detected ($p = 0.44$).

Top four countries of first authors were United Kingdom (32.9%; 535/1624), Germany (6.8%; 110/1624), France (6.1%; 99/1624) and

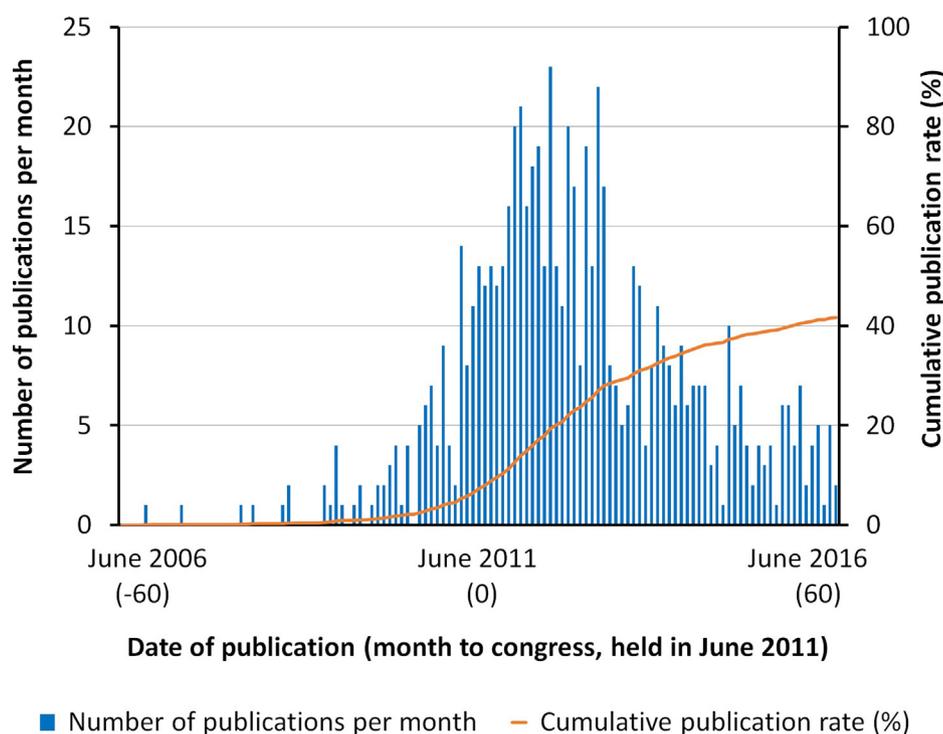


Fig. 1. Number of publications per month and cumulative publication rate for studies presented as abstracts at the EFORT congress held in June 2011.

Table 1

Journals in which the full papers corresponding to abstracts presented at the 2011 EFORT congress were published (with a minimum of ten publications).

Journal title	Number of publications (% of all publications)
<i>Journal of Bone and Joint Surgery – Br. Vol. Since September 2011: Bone & Joint Journal</i>	22 (3.2) 13 (1.9) total: 35 (5.1)
<i>International Orthopaedics</i>	32 (4.7)
<i>Journal of Arthroplasty</i>	32 (4.7)
<i>Clinical Orthopaedics and Related Research</i>	26 (3.8)
<i>Acta Orthopaedica</i>	24 (3.5)
<i>Journal of Bone and Joint Surgery – Am. Vol.</i>	24 (3.5)
<i>Orthopaedics & Traumatology: Surgery & Research</i>	24 (3.5)
<i>Injury</i>	22 (3.2)
<i>Archives of Orthopaedic and Trauma Surgery</i>	20 (3.0)
<i>Knee</i>	19 (2.8)
<i>Knee Surgery, Sports Traumatology, Arthroscopy</i>	19 (2.8)
<i>Hip International</i>	17 (2.5)
<i>European Journal of Orthopaedic Surgery & Traumatology</i>	14 (2.1)
<i>Orthopedics</i>	13 (1.9)
<i>Spine</i>	13 (1.9)
<i>Acta Orthopaedica Belgica</i>	12 (1.8)
<i>Journal of Shoulder and Elbow Surgery</i>	11 (1.6)
<i>American Journal of Sports Medicine</i>	10 (1.5)
Others	310 (45.8)
Total	677 (100)

Spain (6.1%; 99/1624). First authors from Germany (110; 6.8%), at 57.3% (63/110), had a significantly higher publication rate than first authors from other countries, at 40.3% (614/1514) ($p < 0.01$; OR 1.96; 95% CI: 1.33–2.91). The first author was male in 76.2% (1237/1624) and female in 12.3% (200/1624) of the congress abstracts. The difference in the publication rate between male and female first authors was not significant ($p = 0.11$).

The average number of authors in the congress abstracts was 4.8 (1–13). A new author was added in 59.5% (403/677) of the publications. The first author of the congress abstract was the first or last author in 78.1% (529/677) of the publications. The sample sizes

were the same in 68.7% (465/677) of the publications, smaller in 7.2% (49/677) and larger in 13.1% (89/677). No sample size was reported in 10.9% (74/677) of the publications. All 677 publications presented the same main result.

4. Discussion

The publication rates for other international conferences in orthopaedics and traumatology range from 22% to 66% [2–8,10–13]. The latest Cochrane Review reports an overall mean publication rate for abstracts of 44.5% for 79 medical congress studies, with a range from 8% to 81% [16]. The two available studies on the EFORT congress reported a publication rate of 40.3% following oral trauma presentations at the EFORT congresses in 1999 and 2001 and a publication rate of 22% for the EFORT congresses in 2003 and 2005, limited to abstracts related to hip surgery [8,11]. With a publication rate of 41.7%, the 2011 EFORT congress is in the middle of the range reported in the literature. This indicates that the quality of the abstracts presented at the 2011 EFORT congress was comparatively high. More than half of the abstracts presented at the 2011 EFORT congress were not published in a peer-reviewed journal. A high quality of research can only be guaranteed by a journal's review process [2]. In a surgical field, researchers' lack of time due to their high workload might be an explanation for non-publication. A total of 105 studies (15.5% of all publications) were published before the presentation of their abstracts at the 2011 EFORT congress. Congress organisers try to avoid the submission of abstracts after publication, but the literature shows rates of 5–19% for congress abstracts of studies that have already been published [2,3,5–8,10]. One explanation for this might be the length of time between the submission of abstracts and their presentation at a congress. In this study, the mean impact factor for all publications was 1.77. The 2011 EFORT congress is at top of the range here, as is shown by other studies in the literature that report mean impact factors of 1.0–1.8 [2–5,10,11].

Oral presentations, experimental studies, higher levels of evidence, randomised studies, prospective studies, multicentre

Table 2
Characteristics of abstracts presented at the 2011 EFORT congress and their publication rate.

	Publication rate (relative to associated no. of abstracts) (%)	Abstracts n	% (100% = 1624 abstracts)	Publications n	% (100% = 677 publications)
<i>Presentation</i>					
Oral presentation ^a	52.2	617	38.0	322	47.6
Poster	35.3	1007	62.0	355	52.4
<i>Type of study</i>					
Experimental study ^a	52.9	208	12.8	110	16.2
Clinical study	40.4	1254	77.2	507	74.9
Epidemiological study	33.3	93	5.7	31	4.6
Meta-analysis/Review	59.3	27	1.7	16	2.4
Case report	31.0	29	1.8	9	1.3
Other	30.8	13	0.8	4	0.6
<i>Clinical studies</i>					
Therapeutic study	39.5	988	60.8	388	57.3
Prognostic study	45.5	132	8.1	60	8.9
Diagnostic study	46.0	113	7.0	52	7.7
Economic study	41.7	12	0.7	5	0.7
<i>Level of evidence (clinical studies)</i>					
Level I ^a	61.8	123	7.6	76	11.2
Level II ^a	56.2	121	7.5	68	10.0
Level III	39.3	333	20.5	131	19.4
Level IV	34.4	672	41.4	231	34.1
<i>Randomised study^a</i>					
Prospective study	54.7	375	23.1	205	30.3
Retrospective study	35.0	922	56.8	323	47.7
Study with significant main result ^a	58.6	512	31.5	300	44.3
Study with non-significant main result	38.2	170	10.5	65	9.6
Multicentre study ^a	58.6	87	5.4	51	7.5
Single-centre study	40.7	1537	94.6	626	92.5
<i>Anatomic location</i>					
Shoulder	39.0	100	6.2	39	5.8
Wrist/Hand	38.5	65	4.0	25	3.7
Upper limb (without shoulder, wrist and hand)	46.3	95	5.8	44	6.5
Spine	48.6	111	6.8	54	8.0
Pelvis (without hip)	50.0	28	1.7	14	2.1
Hip	42.0	421	25.9	177	26.1
Knee	44.4	331	20.4	147	21.7
Foot/Ankle	37.7	106	6.5	40	5.9
Lower limb (without hip, knee, foot and ankle)	36.8	193	11.9	71	10.5
Classification not possible	37.9	174	10.7	66	9.9
<i>Country of first author</i>					
United Kingdom	34.8	535	32.9	186	27.5
Germany ^a	57.3	110	6.8	63	9.3
France	52.5	99	6.1	52	7.7
Spain	28.3	99	6.1	28	4.1
Italy	53.8	78	4.8	42	6.2
Other	43.5	703	43.3	306	45.2
<i>Male first author</i>					
Male first author	43.0	1237	76.2	532	78.6
<i>Female first author</i>					
Female first author	37.0	200	12.3	74	10.9

^a Significant difference.

studies, and studies reporting a significant main result have substantially higher chances of subsequent publication. These results are consistent with those of other studies investigating the publication rate for congress abstracts [3,5,10,12]. Usually more time and effort are needed to conduct experimental studies, studies with higher levels of evidence, randomised studies, prospective studies and multicentre studies. Maybe therefore the authors have a greater interest in publishing their congress abstracts. It has been shown that journals that include a larger number of studies with a high level of evidence achieve a higher impact factor [17]. First authors from Germany are a small group at the 2011 EFORT congress in comparison to first authors from the United Kingdom, but they have a significantly higher publication rate than first authors from other countries. Maybe the few studies from German first authors have a higher quality and therefore achieve a higher publication rate.

When the groups of authors listed for the congress abstracts and corresponding publications were compared, it was found that a new author was added in 59.5% of the publications. This result

may be explained by continuation of the research or revision of the studies.

The present study is subject to certain limitations. The publication rate may have been underestimated as a result of the observation period of 5 years after the congress. Searching for publications in PubMed alone might be another potential reason for underestimation of the publication rate. A Google Scholar search has also been used in other studies, but it was found that there were no significant differences between PubMed and Google Scholar in detecting publications [11]. The second author performed the PubMed search in this study manually. This could be another potential reason for underestimation of the publication rate. It is possible that a second searcher improves the results of the PubMed search. Nevertheless, the methodology used in this study has been reported in several other studies [3–6,8,10,11,14]. Another limitation of the present study is that only one year of the EFORT congress was investigated. Therefore, the publication rate applies to the 2011 EFORT congress and cannot be generalized.

5. Conclusion

In conclusion, a publication rate of 41.7% and an average impact factor of 1.77 confirm the high quality of abstracts presented at the 2011 EFORT congress. Types of study that are more likely to achieve subsequent publication are oral presentations, experimental studies, those with higher levels of evidence, randomised studies, prospective studies, multicentre studies and studies reporting a significant main result. It is important to be aware that more than half of the congress abstracts presented at the 2011 EFORT congress remain unpublished and have not passed the more extensive review process required for peer-reviewed journals.

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

Disclosure of Interest

The authors declare that they have no conflict of interest.

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Contribution

M. Trost (Study design, statistics, manuscript writing), F. Langer (Study design, data collection, manuscript writing), P. Lechler (Study design, manuscript edition), F. Schröder (Study design, manuscript edition), M. Wetterkamp (Study design, statistics), T. L. Schulte (Study design, manuscript revision), P. Eysel (Supervision, manuscript revision), C. K. Boese (Supervision, manuscript revision). All authors have read and approved the final manuscript.

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