

The Publication Rate of Abstracts from the 4th Park City Pediatric Rheumatology Meeting in Peer-Reviewed Journals: What Factors Influenced Publication?

PHILIP J. HASHKES AND YOSEF UZIEL

ABSTRACT. *Objective.* To measure the impact of a rheumatology scientific meeting by examining publication rates of the abstracts in peer-reviewed journals and to investigate factors that influenced publication.

Methods. We examined the outcome of 257 abstracts submitted to the 1998 4th Park City Pediatric Rheumatology meeting, all of which were published in *The Journal of Rheumatology* (April 2000). A MEDLINE search of all abstracts, by authors, topics, and keywords was performed. A mail questionnaire regarding publication and factors influencing submission was sent to authors of abstracts not found in this search. Factors analyzed for influence on publication included author geography, disease studied, study topic, study design, positive or negative results, and the novelty of the study.

Results. Ninety-two abstracts (36%) were published as of January 2002 in peer-reviewed journals, most frequently in *The Journal of Rheumatology* (32 abstracts). Factors with a positive influence on publication included abstracts from the Middle East, analytical studies, positive results, and novel studies. Factors negatively associated with publication include origin from South and Central America, studies of physical therapy, education and psychosocial issues, and studies with negative results. The main causes cited by authors for not submitting abstracts for publication included a lack of time or low priority to write a full paper, or a desire to further expand the study.

Conclusion. The 4th Park City meeting had an important clinical scientific impact measured by abstracts published in peer-reviewed journals. In future meetings, abstracts that will eventually be published are likely to have an analytical design, positive results, and a novel topic. (*J Rheumatol* 2003;30:597–602)

Key Indexing Terms:

PEDIATRIC RHEUMATOLOGY PUBLICATION ABSTRACT JOURNAL

One measure of the impact of a scientific meeting is the publication rate of abstracts in peer-reviewed journals. Studies from various meetings have reported a publication rate of 25–78%^{1–17}. Most publications occur within 1 to 3 years of the meeting^{1,2,4,5,9,11,14}. Publication rates from rheumatology meetings have not been studied and only few studies of pediatric and internal medicine subspecialty meetings have been performed^{1,2,13,14,17}.

Factors found to have a positive influence on publication include analytically designed studies, especially prospective studies or randomized, controlled trials^{11,13}, positive results, large sample size^{14,18,19}, studies from university-affiliated medical centers¹⁴, and multicenter studies¹⁷. In contrast, basic science studies were found in one meeting to have a negative

influence on publication¹¹. Several author-related factors include a fear of rejection and submission delays due to low priority or a desire to further expand the original study¹⁹.

The Park City Pediatric Rheumatology Meetings occur approximately every 5 years and make a major contribution to this speciality. Over 400 participants from 33 countries participated in the 4th conference in March 1998. Two hundred and fifty-seven abstracts were submitted to the meeting and all were presented as posters and later published in a supplement of *The Journal of Rheumatology*²⁰. Our objective was to determine the publication rates of abstracts submitted to this meeting in peer reviewed journals and to investigate factors that influenced publication.

MATERIALS AND METHODS

We performed a MEDLINE search of all 257 abstracts presented at the 1998 4th Park City meeting by indexing first, last, and senior authors, and keywords. Questionnaires were sent by mail and electronic mail (with reminders, including in person) to first and/or senior authors (or center coordinators) of abstracts not found in this search. The questionnaire included queries about the publication status of the abstract in a peer-reviewed journal and causes for rejection or for not submitting the abstract for publication. Possible causes included abstracts of case reports or series, methodological problems of the study, if the study was previously reported or had negative results, a desire to expand the study, lack of time to write a full paper, low priority, rejection fear, or other causes. Authors were asked if they still had plans to submit their study for publication.

From the Pediatric Rheumatology Service, Sieff and Poriya Hospitals, Safed and Tiberias, and the Pediatric Rheumatology Service, Meir Medical Center, Kfar-Saba, Israel.

P.J. Hashkes, MD, MSc, Clinical Lecturer, Technion Medical School, Haifa, Pediatric Rheumatology Service, Sieff and Poriya Hospitals; Y. Uziel, MD, MSc, Senior Clinical Lecturer, Tel-Aviv University Medical School, Pediatric Rheumatology Service, Meir Medical Center.

Address reprint requests to Dr. P.J. Hashkes, Department of Rheumatic Diseases, A-50, Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, Ohio 44195, USA. E-mail: hashkep@ccf.org

Submitted February 22, 2002; revision accepted September 4, 2002.

To compare the publication rate from the 4th Park City meeting to previous Park City meetings, we obtained a random sample of 50% of the abstracts (by random number table) from the 2nd and 3rd Park City meetings^{21,22}. There were 55 abstracts submitted to the 2nd meeting in 1986 and 92 abstracts at the 3rd meeting in 1991. A summary of the talks given at the 1st Park City meeting in 1976 was published²³. However, unsolicited research abstracts were not included in this supplement.

We investigated several factors for their possible effect on publication. (1) Geography of the author/s: North America, Western Europe, Central and South America, Middle East (Turkey, Israel, Saudi Arabia), and other (Asia, Australia, East Europe and Africa). (2) Disease studied: juvenile rheumatoid arthritis (JRA), systemic lupus erythematosus (SLE), dermatomyositis, vasculitis, infectious-related, spondyloarthropathies, pain syndromes, and other. (3) Topic studied: epidemiology, etiology, pathogenesis, clinical manifestations and outcome, diagnosis, treatment, physical and occupational therapy, and psychosocial and educational issues. (4) Study design: case report, case series, descriptive, analytical (including clinical trials), or basic science. (5) Results: positive, negative, not applicable, or similar studies previously published.

Abstracts were classified independently by both authors, and disagreements resolved by consensus discussion. Factors were analyzed for significance by nominal logistic regression, chi-square tests, odds ratio (OR), and 95% confidence intervals (CI).

RESULTS

Ninety-two (36%) abstracts had been published as of January 2002 in peer-reviewed journals, most frequently in *The Journal of Rheumatology* (Table 1). Over two-thirds of the publications were in rheumatologic journals, 13% in various pediatric journals, 5% in immunology journals, and only 2% in general medicine journals. Five of the abstracts had been published prior to the meeting. Fifteen papers were published

Table 1. Journals in which abstracts were published (n = 92).

Journal	n (%)
The Journal of Rheumatology	32 (35)
Arthritis & Rheumatism	11 (12)
Clinical and Experimental Rheumatology	5 (5)
Other rheumatologic journals (total)	15 (16)
Annals of Rheumatic Diseases	3
Arthritis Care & Research	3
Rheumatology	2
Scandinavian Journal of Rheumatology	2
Clinical Rheumatology	2
Seminars of Arthritis & Rheumatism	1
Lupus	1
Current Rheumatology Reports	1
General pediatric journals (total)	7 (8)
Journal of Pediatrics	4
Pediatrics	1
Acta Pediatrics	1
Arch Pediatr Adolescent Med	1
General medical journals (total)	2 (2)
Lancet	1
New England J Medicine	1
Immunologic journals (total)	5 (5)
Other journals (partial list) (total)	15 (16)
Pediatric subspecialty journals	5
Foreign language journals	4
Non-medical journal	2

in the first year after the meeting, 32 in the second year, 23 in the 3rd year, 12 in the 4th year and 5 papers are still in press. The median time of publication was 2 years after the meeting. We found 10 other papers related to submitted abstracts, but the content of the published article was not sufficiently related to the content of the abstract to be considered as publication of the abstract.

The publication rate from previous Park City meetings was 56% from the 2nd meeting and 57% from the 3rd meeting. We received 109 (66%) replies to the 165 questionnaires sent to authors of abstracts not yet published. Twelve abstracts were still under consideration for publication; of these 6 were rejected between 1-6 times. Ninety-seven abstracts were never submitted for publication. The major reason cited by authors for not submitting the abstract were a lack of time or low priority to write a paper (49%) or a desire to expand the study before submission as a paper (43%) Other reasons are detailed in Table 2. Authors reported plans to submit 71 further abstracts for publication.

Author's geography (Figure 1). North American authors submitted the most abstracts to the 4th Park City meeting (53%) while only 3% were submitted from Asia, Australia, East Europe, and Africa. The author's geography was significantly associated with publication in a peer-reviewed journal ($p = 0.001$). A significantly higher proportion of abstracts from the Middle East were published (85%, OR: 11.1, 95% CI: 2.5-50, $p = 0.0005$), while a significantly lower proportion were published from South and Central America (11%, OR: 0.2, 95% CI: 0.1-0.3, $p = 0.0002$). The proportion of abstracts published from Western Europe (45%) and North America (36%) were not significantly different from the overall publication rate.

Disease studied (Figure 2). The diseases most frequently studied were juvenile rheumatoid arthritis (46% of abstracts submitted to the meeting) and SLE (17%). The highest proportion of abstracts published in a peer-reviewed journal was from studies of dermatomyositis (45%), while spondyloarthropathy studies had the lowest proportion of publication (14%). The disease studied was not a significant factor in publication.

Topic studied (Figure 3). The most common topics studied among abstracts submitted to the meeting were of clinical (36%) and treatment studies (19%), while etiology and phys-

Table 2. Reasons for non-submission of abstract for publication (n = 97)*.

Case report	8
Previously reported	5
Non-positive results	2
Methodological problems	2
Desire to expand paper	42
Low priority or lack of time	47
Fear of rejection	13
Author moved or passed away	4
No decision on journal	1

*Some authors gave more than 1 reason.

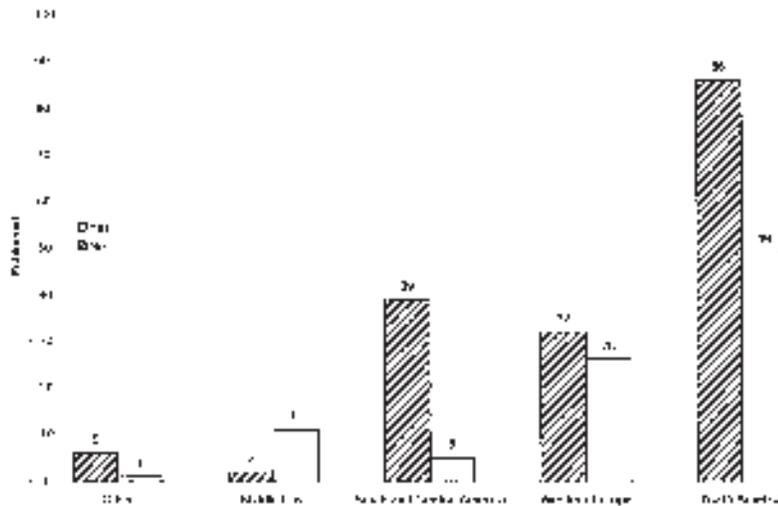


Figure 1. The absolute number of abstracts published or not published for each geographic region.

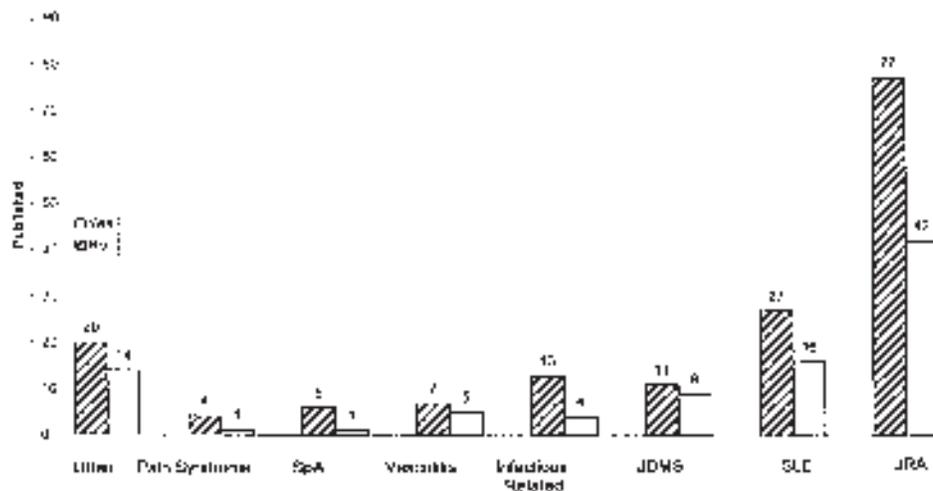


Figure 2. The absolute number of abstracts published or not published for each disease.

ical therapy studies were only 3% each of the submitted abstracts. The topic studied was significantly associated with publication in a peer-reviewed journal ($p = 0.02$). The highest rates of publication were for studies of pathogenesis (52%), etiology (50%), and epidemiology (48%). The OR for publication of these topics were not significantly different due to the small number of studies of each. Only 10% of the allied health topics abstracts (psychology, education, physical and occupational therapy) were published (in comparison to the overall publication rate the OR: 0.2, 95% CI: 0.1-0.3, $p = 0.003$).

Study design (Figure 4). The most common study design among abstracts submitted to the meeting was descriptive (49%). Since the 4th Park City meeting was primarily a clinical and clinical research meeting, only 12 (5%) of the submitted abstracts were basic science studies. Case reports and case

series made up 38% of the submitted abstracts. Analytical studies and basic science studies had the highest proportion of publication in a peer-reviewed journal (49% and 42%, respectively) while descriptive studies had the lowest proportion (27%). The study design was weakly associated with the rate of publication ($p = 0.05$). The OR of an analytical study being published was 2.1 (95% CI: 1.5-2.8, $p = 0.007$) while the OR of a descriptive study was 0.5 (95% CI: 0.4-0.6, $p = 0.005$).

Positivity of results (Table 3). Positive results were significantly associated with publication ($p = 0.03$). The OR of a study with positive results being published as opposed to studies with negative results was 5.6 (95% CI: 2.5-12.2). Fifty-four (58%) of the published abstracts had positive results, while only 2 (2%) had negative results. Forty-eight percent (54/112) of the abstracts with positive results were published,

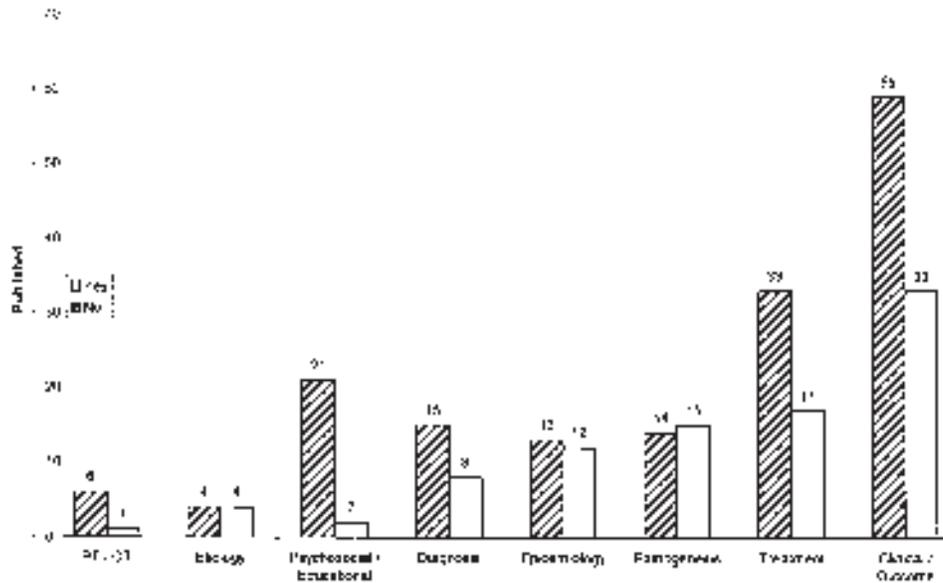


Figure 3. The absolute number of abstracts published or not published for each study topic.

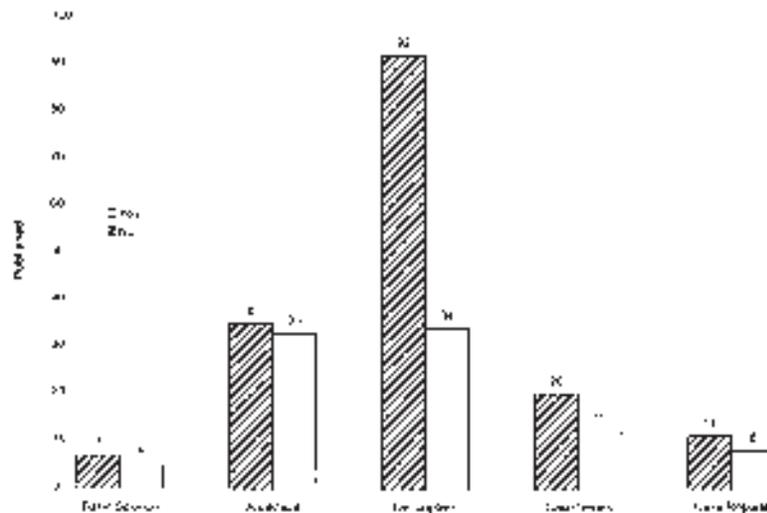


Figure 4. The absolute number of abstracts published or not published for each study design.

while 86% (12/14) of the studies with negative results were not published.

Prior publication of similar studies (Table 3). Novel studies were associated with an increased publication rate ($p = 0.001$). The OR of publishing a novel study as opposed to those similar to a study previously reported was 3.1 (95% CI: 2.3-4.1). Twenty-nine (32%) of the published abstracts were considered novel while only 20 (12%) of unpublished abstracts were novel. We were unable to determine for 83 (32%) abstracts whether the study was novel or not.

DISCUSSION

As of January 2002, over 90 peer-reviewed publications resulted from the abstracts presented at the 1998 4th Park City pediatric rheumatology meeting. Most were published in rheumatology journals. Some of these papers have had an important influence on the daily practice of pediatric rheumatology²⁴⁻²⁶. The publication rate of 36% is within the range of most series from other meetings, although lower than that of the 2nd and 3rd Park City meetings. However the absolute number of abstracts published as papers from this meeting

Table 3. Number of publications by “positivity” of results and by previous publication of similar study. Note the small number of abstracts with negative results. Many abstracts, such as case reports, case series, and descriptive studies have results that cannot be described as positive or negative. For many studies, it wasn’t possible to decide if the topic had been previously studied.

	Published (n)	Not Published (n)
Positive results	54	58
Negative results	2	12
Results not positive or negative	36	95
Previously studied	40	85
Not previously studied	29	20
Unclear if previously studied	23	60

was 3 times that published from the 2nd Park City meeting and nearly twice the number from the 3rd Park City meeting. The highest rates of publications were from surgical meetings and the British Paediatric Societies^{4,8-10,13}. The publication rate from 2 internal medicine subspecialty meetings, gastroenterology and cardiology, was 47 and 49.6%, respectively^{1,17}. The lower publication rate from the 4th Park City is unclear. It is possible that the increased number of abstracts submitted to the 4th Park City meeting (2.5 times that of the 3rd meeting and 5 times that of the 2nd meeting) with greater international participation was a factor in the lower publication rate. The publication rate may grow if some of the 71 abstracts planned by authors are submitted as papers. However, the additional number of publications from the 4th Park City meeting will probably be small. Data from other studies has indicated that the vast majority of papers were published within 4 years of the meeting^{2,4,5,9,11,14}. Furthermore, the number of published papers from the 4th Park City meeting has decreased every year since 2000. Most authors stated they did not submit their abstract as a paper either because they desired to expand the study into a more significant paper (42 authors) or could not find the time or priority (47 authors). It is more likely that the first group will eventually submit a paper than the latter.

It is important to note that there was no selection of abstracts prior to the meeting. In other words all submitted abstracts were accepted for presentation as posters and later published in *The Journal of Rheumatology* supplement²⁰. In contrast, abstracts submitted to other rheumatology meetings, such as the American College of Rheumatology (ACR) annual meeting are judged and only about 60% are accepted for presentation. Only 60% of the abstracts submitted to the pediatric rheumatology section of the 65th ACR annual meeting of 2001 were accepted for presentation (data presentation orally by Dr. David Sherry). It is not clear whether preselection increases the publication rate of abstracts. In several studies, presentation at a meeting significantly predicted publication in a peer-reviewed journal with an OR of 2.3^{17,19}. In contrast, data from the 1994 American Society of Gastrointestinal

Endoscopy meeting found only a 25% publication rate despite abstract preselection¹⁴.

It would have been much more difficult to do this study from abstracts presented at a general rheumatology meeting, such as the annual ACR meeting, since the number of abstracts often exceeds 2000. Indeed, we did not find any studies of publication rates from general rheumatology meetings.

We found several factors associated with publication, including the geography of the author, study topic, study design, positivity of results, and novelty of the study. The association of positive results and publication has been noted by other authors, with an approximately twofold chance of publication^{14,15,18}. This association was not found in one study, although abstracts with positive results were published in journals with higher readership¹⁷. Analytical studies, especially randomized clinical trials, were also found to be associated with publication^{11,13,14}. We found that the geography of the authors was associated with publication. Over 80% of the abstracts from the Middle East were published, although the number of abstracts was small (only 13). In contrast, only 11% of abstracts from South and Central America were published. The reason for this is not clear. Unfortunately, many of the unanswered questionnaires were from those authors. It should be noted that for many non-North American authors, submission and acceptance of an abstract to a meeting is necessary for obtaining funding for attending the meeting. We also found that the publication rate of abstracts from allied health studies was significantly lower than other topics. One of the reasons may be a relative paucity of journals for these studies as compared to the variety of journals available for medical studies.

It is interesting to note that very few abstracts submitted as papers were rejected. Only 6 rejected abstracts were not yet published and these are currently under consideration. This may indicate the high level of abstracts presented at the meeting. It is possible however, that authors tend to submit papers based on a premonition of acceptance.

We conclude that the 4th Park City meeting was important in clinical scientific terms based upon the number of abstracts subsequently published in peer-reviewed journals. This importance may increase if more abstracts are submitted as papers. Geographic factors, study topic and design, positivity of results, and study novelty had a significant effect on publication rates.

Although we studied a pediatric rheumatology meeting, our results may be applicable to general rheumatology meetings. Abstracts that will eventually be published are likely to have an analytical design, positive results, and novel topic, while descriptive studies and studies of allied health professional topics have a smaller probability of publication. Mentors of fellows and young faculty should take these factors into consideration in research selection and design. Appropriate selection of study topic and design may result in

a higher proportion of abstracts submitted and published as full manuscripts in peer-reviewed journals.

REFERENCES

1. Goldman L, Loscalzo A. Fate of cardiology research originally published in abstract form. *N Engl J Med* 1980;303:255-9.
2. McCormick MC, Holmes JH. Publication of research presented at the pediatric meetings: change in selection. *Am J Dis Child* 1985;139:122-6.
3. Gorman RL, Oderda GM. Publication of presented abstracts at annual scientific meetings: a measure of quality? *Vet Hum Toxicol* 1990;32:470-2.
4. Juzych MS, Shin DH, Coffey JB, Parrow KA, Tsai CS, Briggs KS. Pattern of publication of ophthalmic abstracts in peer-reviewed journals. *Ophthalmology* 1991;98:553-6.
5. Yentis SM, Campbell FA, Lerman J. Publication of abstracts presented at anaesthesia meetings. *Can J Anaesth* 1993;40:632-4.
6. Elder NC, Blake RL Jr. Publication patterns of presentations at the Society of Teachers of Family Medicine and North American Primary Care Research Group annual meetings. *Fam Med* 1994;26:352-5.
7. Landry VL. The publication outcome for the papers presented at the 1990 ABA conference. *J Burn Care Rehabil* 1996;17:23A-26A.
8. Ngyyen V, Tometta P 3rd, Bkaric M. Publication rates for the scientific sessions of the Orthopedic Trauma Association. *J Orthop Trauma* 1998;12:457-9.
9. Daluiski A, Kuhns CA, Jackson KR, Lieberman JR. Publication rate of abstracts presented at the annual meeting of the Orthopaedic Research Society. *J Orthop Res* 1998;16:643-9.
10. Wang JC, Yoo S, Delamarter RB. The publication rate of presentations at major spine specialty society meetings (NASS, SRS, ISSLS). *Spine* 1999;24:425-7.
11. Marx WF, Cloft HJ, Do HM, Kallmes DF. The fate of neuroradiologic abstracts presented at national meetings in 1993; rate of subsequent publication in peer-reviewed, indexed journals. *Am J Neuroradiol* 1999;20:1173-7.
12. Byerly WG, Rheney CC, Connelly JF, Verzino KC. Publication rates of abstracts from two pharmacy meetings. *Ann Pharmacother* 2000;34:1123-7.
13. Riordan FA. Do presenters to paediatric meetings get their work published? *Arch Dis Child* 2000;83:524-6.
14. Eloubeidi MA, Wade SB, Provenzale D. Factors associated with acceptance and full publication of GI endoscopic research originally published in abstract form. *Gastrointest Endosc* 2001;53:275-82.
15. Scherer RW, Dickersin K, Langenberg P. Full publication of results initially presented in abstracts. A meta analysis. *JAMA* 1994;272:158-62.
16. Walby A, Kelly AM, Georgakas C. Abstract to publication for papers presented at scientific meetings: how does emergency medicine compare? *Emerg Med* 2001;13:460-4.
17. Timmer A, Hilsden RJ, Cole J, Hailey D, Sutherland LR. Publication bias in gastroenterological research: a retrospective cohort study based on abstracts submitted to a scientific meeting. *BMC Med Res Methodol* 2002;2:7.
18. Callaham ML, Wears RL, Weber EJ, Barton C, Young G. Positive-outcome bias and other limitations in the outcome of research abstracts submitted to a scientific meeting. *JAMA* 1998;280:254-7.
19. Weber EJ, Callaham ML, Wears RL, Barton C, Young G. Unpublished research from a medical specialty meeting: why investigators failed to publish. *JAMA* 1998;280:257-9.
20. Lovell DJ, editor. *Park City IV: Pediatric rheumatology into the next century*. *J Rheumatol* 2000;27 Suppl 58:68-110.
21. Abstract conference of rheumatic diseases of childhood. *J Rheumatol* 1986;13 Suppl 5:973-85.
22. Lovell D, White P, editors. *Pediatric rheumatology into the 90s*. *J Rheumatol* 1992;19 Suppl 33:112-27.
23. Proceedings of the first ARA conference on the rheumatic diseases of childhood. Park City, Utah, March 22-25, 1976. *Arthritis Rheum* 1977;20 Suppl:145-628.
24. Lovell DJ, Giannini EH, Reiff A, et al. Etanercept in children with polyarticular juvenile rheumatoid arthritis. *N Engl J Med* 2000;342:763-9.
25. Sherry DD, Stein LD, Reed AM, Schanberg LE, Kredich DW. Early intraarticular steroids decrease leg length discrepancy in young children with pauciarticular juvenile rheumatoid arthritis. *Arthritis Rheum* 1999;42:2330-4.
26. Cabral DA, Tucker LB. Malignancy in children who present with rheumatic complaints. *J Pediatr* 1999;134:53-7.

