

Results reflect the overall high quality of cardiology research in Switzerland

Publication rate and impact factor of abstracts presented at SSC congresses 2011 to 2014

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Summary

BACKGROUND: The annual congress of the Swiss Societies of Cardiology and Cardiac Surgery is the most important national platform for Swiss researchers in these specialities. Every year there are a high number of oral presentations and posters. However, more important is their publication in international journals. We determined publication rates, impact factors (IFs) and their temporal trends in seven cardiological domains.

METHODS: The abstract booklets of the congresses 2011–2014 were downloaded and all talks and posters presented during the meeting extracted. In PubMed we assessed whether each of these papers was published, the journal and its IF in the respective publication year. We excluded case reports, papers published >6 months before the congress and abstracts presenting national data from multicentre studies (unless the first/last author of the paper was from Switzerland). The percentage of published papers and their mean/median IF were calculated overall and per year separately for each domain. We also compared major Swiss hospitals regarding their individual publication rates.

RESULTS: A total of 715 abstracts were included, of which 52% were published as of February 2017. The lowest average publication rate in a domain was 36% and the highest 69%, with mean IFs between 2.5 and 7.8. The lowest average publication rate in one of the major hospitals was 16% and the highest 70%.

CONCLUSIONS: Abstracts presented during the congresses had a high chance of being published, usually in papers with a good IF. This reflects the good quality of research in cardiology in Switzerland.

Key words: abstracts; publication; impact factor; Swiss Society of Cardiology



At the annual congress of the Swiss Societies of Cardiology and Cardiac Surgery (SSC) current research results are presented. Abstracts can be submitted to the congress website at the beginning of each year and are rated by experts in the corresponding domain. Accepted abstracts are then presented at the annual congress either in an oral session or as a poster. Acceptance of the submitted abstracts and presentation of the results of a study at the annual congress is praise-

worthy, but more important is their publication in important international journals.

This study aims to give an overview of the state of scientific work in the field of cardiology in Switzerland. We determined how many of the studies presented at the four congresses were published and, if so, in which journal and with what impact factor (IF). We further looked for differences between the various cardiological domains in terms of publication rate and average IF, and whether they were accepted as a poster or as an oral presentation. Finally, we compared these data between the major Swiss hospitals.

Methods

Study concept and data collection

The abstract booklets of the congresses 2011 to 2014 were downloaded as PDF files. All talks and posters were allotted to one of the following seven domains:

1. Cardiovascular biology ("biology");
2. Pacemaker/defibrillator and electrophysiology ("devices");
3. Cardiac failure, valvulopathies, cardiomyopathies, pericardiopathies, heart transplantation ("heart failure");
4. Acute coronary syndrome (ACS), percutaneous coronary intervention (PCI), coronary artery bypass graft surgery (CABG) ("CAD");
5. Epidemiology, risk factors, rehabilitation, thromboembolic disease ("epidemiology");
6. Cardiac imaging, congenital and paediatric cardiology ("imaging");
7. Cardiac surgery.

In most cases the classification was made according to the domains to which they were submitted. However, a few abstracts were reclassified. For example, abstracts concerning CABG or heart transplantation were reclassified into the category "Cardiac surgery" if they were submitted by researchers from a cardiac surgery department. In November 2015, all abstracts were

searched for via PubMed and if they had been published, we documented the journal and the publication year. All studies that were not found in the first round were searched for again in spring 2016 and finally in February 2017; if they had been published, they were added as described above. The abstracts were initially screened for with the submitted title, then if untraceable with relevant keywords and in a third attempt with the first and/or last author name. The IF of the year in which each paper was published was recorded. As the IFs of 2016 were not released at the time of final analysis, the IF of the previous year was used, but this concerned only isolated papers. The impact factors of the journals were taken from the website <http://admin-apps.webofknowledge.com>. If they were not available there, they were searched for on the journal homepage. Journals for which the IF could not be determined were rated with an IF of 0.

Excluded were seven papers published more than 6 months before the corresponding SSC congress (we doubt that it was correct to submit them as abstracts to the SSC congress, according to congress rules), case reports, and all abstracts presenting national data from a multicentre study (unless the first, last or corresponding author of the published paper was from a Swiss hospital). Published and unpublished studies were then assigned to the corresponding hospital, according to the abstract booklet and the first, last or corresponding author of the paper. In some cases when more than one hospital was involved in the publication, the hospital of the last or corresponding author was chosen. For interhospital comparison we present separate data for the seven hospitals with the most successfully submitted abstracts. The remaining hospitals that submitted at least one abstract are also shown, but results have to be interpreted with caution because of mostly very small numbers of accepted abstracts. For calculation of the delay between presentation at the congress and publication, we allowed for a certain simplification. It would not be possible to determine the exact date of publication and so we set it to December of the year of publication.

Statistics

We used the statistic program acula statistics calculator to determine means, medians and interquartile ranges in the different categories. A Cox regression analysis was performed to investigate whether there was a higher likelihood of publication of abstracts presented in earlier congresses. The temporal trend of the publication rates was calculated with the two-sided Cochran-Armitage Trend Test and the use of SAS Version 9.4 (SAS Institute, Cary, NC). Regardless of distribu-

tion (normal or skewed), we always present mean and median values with either the standard deviation (SD) and 95% confidence interval or the IQR (interquartile range), as to avoid confusion among the many tables and congress years that are shown.

Results

A total of 900 abstracts were accepted in the years 2011 to 2014. Of those, 185 were excluded in accordance with the criteria described in the methods section. Of the remaining studies, 369 (51.6%) had been published as of February 2017 (see fig. 1). Most abstracts were submitted in the domains of “cardiac surgery” and “CAD” with 124 and 123 abstracts, respectively, the lowest number (76 abstracts) in “epidemiology”. The highest publication rates were seen in “heart failure” (70%) and in “biology” (65%), with the lowest in surgery (36%). The highest mean IF was recorded in “biology” at 7.8 and “heart failure” at 6.2, with the lowest in “cardiac surgery” at 2.5. The highest median IF was recorded in “biology” at 5.9 and “heart failure” at 4.2, with the lowest in “cardiac surgery” at 1.3. Looking at temporal trends, we generally noticed a slight decrease in publication rates from 54% in 2011 to 47% in 2014 and stable median IFs. In the different domains, “biology” showed a slight increase in publication rate with rather stable IFs. “Devices” exhibited a stable publication rate and increasing IFs. “Heart failure” had a stable publication rate and a decline in IFs. Of note is the exceptional high mean IF in 2012 due to one *NEJM*, one *Circulation*, and three *European Heart Journal* papers. “CAD” had a decrease in publication rates, but IFs remained stable. “Epidemiology” and “imaging” had undulating publication rates and stable IFs, and finally “cardiac surgery” an increase in publication rates and stable IFs. The domains “heart failure”, “CAD”, and “imaging” showed a borderline decrease in numbers of accepted papers (p-values for trend 0.06, 0.08 and 0.08, respectively). More details

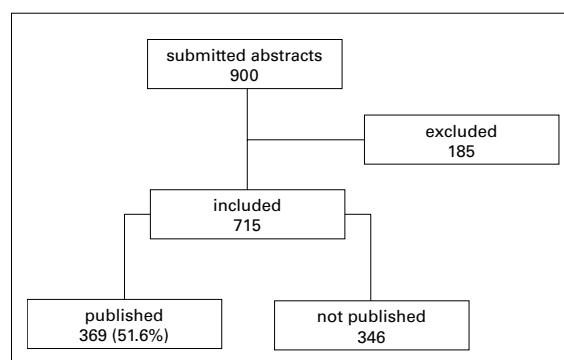


Figure 1: Number of abstracts submitted included and published.

are shown in the tables 1–7. Table 8 shows the percentage of accepted posters and oral presentations. Table 9

Table 1: Results in the domain of cardiovascular biology.

	2011	2012	2013	2014	Overall
Submitted	31	24	13	15	83
Excluded	2	0	0	0	2
Published (%)	18 (62)	16 (67)	8 (62)	11 (73)	53 (65)
Mean IF	6.8	9.3	7	7.6	7.8
SD	3.9	5.4	4.9	5.4	4.8
95% CI	4.9–8.6	6.4–12.2	2.7–11.0	4.0–11.3	1.3–7.7
Median IF	5.6	6.2	5.8	5.3	5.9
IQR	2.6 (4.7–7.3)	9.9 (5.3–15.2)	8.4 (3.4–11.8)	10.8 (4.3–15)	9.7 (4.8–14.5)

Table 2: Results in the domain of pacemaker/defibrillator and electrophysiology.

	2011	2012	2013	2014	Overall
Submitted	30	31	26	25	112
Excluded	4	3	5	1	13
Published (%)	13 (50)	13 (46)	12 (57)	12 (50)	50 (51)
Mean IF	3.3	3.1	3.9	4.8	3.7
SD	1.2	1.6	1.4	3.6	2.2
95% CI	2.6–4.1	2.0–4.1	3.0–4.7	2.1–6.6	3.0–4.3
Median IF	3.4	3.1	4.4	4	3.3
IQR	1.1 (2.5–3.6)	2.6 (1.5–4.1)	1.8 (3.2–4.9)	1.3 (3.1–4.4)	2.1 (2.3–4.4)

Table 3: Results in the domain of cardiac failure, valvulopathies, cardiomyopathies, pericardiopathies, and heart transplantation.

	2011	2012	2013	2014	Overall
Submitted	33	15	20	22	90
Excluded	7	0	1	0	8
Published (%)	19 (73)	13 (87)	14 (74)	11 (50)	57 (70)
Mean IF	5.4	11.9	4.5	3.2	6.2
SD	3.4	15.3	4.7	1.8	8.3
95% CI	3.8–7.1	2.6–21.1	1.8–7.2	1.9–4.4	2.2–6.2
Median IF	5.3	6.6	3.5	2.7	4.2
IQR	3 (3.2–6.2)	11.1 (3.7–14.7)	3.1 (1.6–4.6)	3.7 (1.4–5.1)	3.9 (2.2–6.2)

Table 4: Results in the domain of acute coronary syndrome, percutaneous coronary intervention, and coronary artery bypass graft surgery.

	2011	2012	2013	2014	Overall
Submitted	43	23	31	26	123
Excluded	2	0	5	0	7
Published (%)	25 (60)	18 (78)	10 (39)	12 (46)	65 (56)
Mean IF	6.3	4.2	6.1	6	5.6
SD	4.7	3.6	5.1	5.0	4.5
95% CI	4.4–8.2	2.4–6.0	2.5–9.8	2.8–9.2	1.1–5.6
Median IF	5	3.7	4.4	4.3	4
IQR	3.8 (3.1–6.9)	3.6 (2.2–5.8)	6.3 (3–9.3)	4.7 (2.7–7.4)	3.7 (2.8–6.5)

depicts publication rates of the different hospital groups. The mean delay between the congress and publication date was 20 months for the 2011 congress, 23 for the 2012 congress, 21 months for the 2013 congress, and 17 months for the 2014 congress. Cox regression showed no higher likelihood of publication of abstracts presented at earlier congresses (p-value 0.983).

Discussion

The main finding of our analysis was the overall high quality of cardiology research in Switzerland, based on a high publication rate with good IFs of abstracts accepted for the congresses. There are, however, differences with regard to the domain of research and the performance of the individual hospitals. Results might encourage researchers in domains and/or hospitals with poorer results to further strengthen their efforts to get their work accepted in high ranking journals. To the best of our knowledge, such a study has never been undertaken in Switzerland before; at least none has been published. The policy on accepting abstracts for national congresses in nearby countries such as Germany or France might be completely different and cannot be compared. Our results simply reflect the situation in Switzerland and should be seen as this.

On a European level, abstracts presented to the ESC congress 2006 have been evaluated regarding publication, IF and citation index [1]. A random selection of 10% of all abstracts submitted (n = 1002) was assessed 4.5 years after the congress. In that year, the acceptance rate was 38%, 18% accepted as oral presentations. Factors favouring acceptance were a prospective design and a higher number of patients in the study. Our study was not able to investigate these aspects, as we have no data on rejected abstracts of the congresses. Regarding full-text publication, only 38% of all accepted studies (with no difference between posters and oral presentations) were finally also published, as opposed to 52% in our study. This positive finding could be due to the fact that Swiss researches have more zeal “to take the last mile” compared with their colleagues submitting to the ESC congress, even though the ESC congress is by far larger and more renowned. At ESC level, there was only a small difference among the domains (range 24–31%) as opposed to our study (range 31–65%). Factors that favoured publication at ESC level were the academic setting of the place of research and basic research. This can also be seen in Switzerland where “biology” had the second-highest publication rate and the highest mean and median IF, and the publication rate of university hospitals exceeded that of other hospitals.

Table 5: Results in the domain of epidemiology, risk factors, rehabilitation, and thromboembolic disease.

	2011	2012	2013	2014	Overall
Submitted	24	17	16	19	76
Excluded	3	3	8	1	15
Published (%)	9 (43)	9 (64)	5 (63)	8 (44)	31 (51)
Mean IF	4.7	4.7	3.3	3.9	4.2
SD	3.4	4.5	1.0	1.5	3.1
95% CI	2.1–7.4	1.2–8.1	2.0–4.5	2.6–5.1	3.1–5.4
Median IF	3.8	3.4	2.9	3.9	3.8
IQR	5.4 (1.9–7.3)	4.9 (1.5–6.3)	1.9 (2.4–4.3)	2.3 (2.5–4.8)	4 (2.2–6.2)

Table 6: Results in the domain of cardiac imaging, and congenital and paediatric cardiology.

	2011	2012	2013	2014	Overall
Submitted	35	32	25	15	107
Excluded	2	3	3	1	9
Published (%)	19 (58)	13 (45)	10 (46)	4 (27)	47 (45)
Mean IF	4.3	3.2	4.5	4	4
SD	2.2	1.8	2.3	3.1	2.2
95% CI	3.2–5.4	2.1–4.2	2.8–6.1	1.0–9.0	3.3–4.6
Median IF	4.3	3.9	4.4	4.4	4.1
IQR	2.7 (3.3–5.9)	3.3 (1.3–4.6)	2.8 (2.9–5.6)	6 (0.8–6.8)	3.6 (2–5.5)

Table 7: Results in the domain of cardiac surgery.

	2011	2012	2013	2014	Overall
Submitted	35	30	28	31	124
Excluded	2	1	1	1	5
Published (%)	12 (36)	8 (28)	11 (41)	12 (40)	43 (36)
Mean IF	3.9	2.3	1.7	2.1	2.5
SD	5.2	2.0	1.3	1.4	3.1
95% CI	0.6–7.2	0.7–4.0	0.8–2.5	1.2–2.9	1.6–3.5
Median IF	2.8	1.1	1.1	2.4	1.3
IQR	3.5 (0–3.5)	2.8 (1–3.8)	2.2 (0.8–3.1)	2.2 (1–3.1)	2.4 (1–3.3)

Table 8: Published posters and oral presentations in the different domains (years 2011 to 2014 together).

	Posters	Oral presentations	p-value
Cardiovascular biology	31/46 (67%)	22/35 (63%)	0.81
Pacemaker/defibrillator and electrophysiology	23/58 (40%)	23/58 (40%)	0.01
Cardiac failure, cardiomyopathy, transplant	22/41 (54%)	33/38 (87%)	<0.001
Coronary artery disease	38/69 (55%)	27/48 (56%)	1
Epidemiology, risk factors	20/40 (50%)	11/21 (52%)	1
Cardiac imaging, congenital and paediatric cardiology	23/57 (40%)	23/41 (56%)	0.15
Cardiac surgery	27/80 (34%)	16/39 (41%)	0.54
Overall	184/391 (47%)	159/263 (61%)	<0.001

Table 9: Results of the seven hospitals with the most successfully submitted abstracts, followed by “all others”.

	Included	Published	%
University Hospital Geneva	64	45	70
University Hospital Basel	97	63	65
University Hospital Zurich	119	68	57
University Hospital Berne	156	84	54
Cardiocentro Lugano	32	12	38
University Hospital Lausanne	60	22	37
Stadsspital Triemli Zurich	32	5	16
Hôpital de Morges	2	2	100
Hôpital de la Tour	4	3	75
Kantonsspital St. Gallen	17	11	65
Kantonsspital Luzern	13	8	62
Hôpital Fribourgeois	17	8	47
Children Hospital Zurich	16	7	44
Kantonsspital Olten	3	1	33
Ospedale Regionale di Bellinzona e Valli	9	3	33
Children Hospital Geneva	2	0	0
Hôpital du Jura, Delémont	1	0	0
Kantonsspital Aarau	2	0	0
Kantonsspital Chur	1	0	0
Overall	87	43	49

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An analysis of the different years did not show a lower overall publication rate in the year 2014, which could be expected because of the shorter time frame in which the abstract could have been published. Generally, the vast majority of abstracts are published in the

year of the congress, or within the following two years. As shown with the domain of “heart failure” in the year 2012, a few very high-ranked papers can heighten the mean IF of a specific year, so the median value must also be considered.

Limitations

We are aware that results regarding IFs strongly depend on the IFs of the journals in a specific domain. This mainly applies to research work that is not at such an extremely high level as to be submitted to a top journal. However, overall publication rates are not affected by this limitation. Our last PubMed access was February 2017 and some papers may still be published after that date. This, however, applies to all domains. Papers in journals without an IF and/or that are not PubMed listed (e.g., this very journal) were excluded but may still have their merits. However, in the huge field of often dubious online journals it is very difficult to separate the wheat from the chaff. As we were not able to identify abstracts that were rejected, we could not analyse them regarding possible publication. Finally, the period of 4 years provides only a momentary snapshot, and results might be different in other time frames or longer observation periods.

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