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**Rate of publication in predatory journals by orthopedic surgeons members of the French
Orthopedic and Traumatology Society (SOFCOT): A follow-up note**

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Abstract

Background

France ranks 9th worldwide for scientific publication in orthopedics and the increase in both the quantity and the quality of its scientific production has been described in detail. On the other hand, publishing by French orthopedic surgeons in predatory journals is more obscure. The journals in question are difficult to identify but are based on an open-access model with article processing charges (APC), except in rare cases, that are difficult to specify as they are not stated at the time of submission. The increase in the number of predatory journals over the last 10 years led us to attempt to assess the rate at which French orthopedic surgeons publish in them, as revealed by investigation of the SIGAPS bibliometric database.

Hypothesis

Over the period 2008-2017 the rate of publications by French orthopedic surgeons in predatory journals was less than 5%

Material and Method

The SIGAPS database contains the detail of publications by French orthopedic surgeons members of the French Society of Orthopedic Surgery and Traumatology (SoFCOT) and was used to analyze all such articles (Journal Article, Review or Editorial) so as to isolate articles with PubMed-Not-MEDLINE status falling in the SIGAPS non-classified (NC) category and to determine the predatory status of the journal using established lists such as Beall's List or that drawn up by StopPredatoryJournals. In case of difficulty in determining predatory status, we applied the criteria defined by Beall and the Committee on Publication Ethics (COPE).

Results

Out of 6,056 articles in the SIGAPS database published by French orthopedic surgeons between 2008 and 2017, 323 could be suspected of being published in a predatory journal, but only 33 were so confirmed: i.e., 0.55% of French orthopedic scientific output over the study period. Eleven appeared in journals whose publishers were listed as predatory by Beall, 21 appeared in journals whose publishers had been listed as predatory on Beall's List in 2012 with the dubious editorial practices defined by Beall, and 1 article appeared in a journal found to be predatory on analysis of its editorial board. More than half of these articles (58%) were subject to APCs averaging \$400.

Discussion

Despite a strong increase in the number of predatory journals over the last decade, very few French orthopedic surgeons resort to them to publish their work. Difficulty of identification and authors' lack of knowledge about this type of journals may account for some of these submissions. Scientific teams need to check certain criteria before submitting to a journal: short time to publication and low APC should be taken as warning signs, and any demand for payment after acceptance certainly raises the question of the journal's predatory nature.

Level of evidence: IV; retrospective study without control group

Key-words: Bibliometrics, Impact Factor, Scientific literature, France, Predatory journal

1. Introduction

France ranks 9th worldwide for scientific publication in orthopedics [1]. The rate of orthopedics within French scientific publication as a whole has risen from 1.32% to 2.40% in the last 20 years [1]. Saab et al. [2] showed that, beyond this raw quantitative increase, there has also been a qualitative improvement, with a 14.4% increase in French orthopedic surgeons' publishing in journals ranked A or B in the French SIGAPS (Publication Investigation, Management and Analysis System) bibliometric database. Saab et al. [2] focused on articles indexed in Medline, which count for the "SIGAPS points" used for academic assessment and funding [3–5]. There was no analysis of non-Medline articles, potentially appearing in predatory journals. Such journals are unconcerned by scientific quality and integrity; their editorial, financial and scientific functioning is opaque. They adhere only very loosely if at all to ethical and professional guidelines for scientific publication such as those of the Committee on Publication Ethics (COPE) and International Committee of Medical Journal Editors (ICMJE).

The number of predatory journals has also been increasing over the last decade, exponentially, from 18 in 2011 [6] to 1,319 in September 2019 [7], or between 4,000 and 8,000 according to Cabell's Blacklist [8], a database with a subscription fee of \$12,000 that was not used for the present study. Predatory journals operate on an author-payer open access basis [9] with Article Processing Charges (APC) that are difficult to estimate, not being stated at submission [10]. Via PubMed Central, they may be accessible on PubMed, creating the impression of being indexed in Medline. As there are no data on predatory journals relating to French orthopedic surgeons members of the French Society of Orthopedic Surgery and Traumatology (SoFCOT), we undertook a follow-up to Saab et al.'s study [2], with the aim of determining the rate of French orthopedic surgeons' publishing in predatory journals for the period 2008-2017.

2. Method

Analysis covered 6,056 publications (journal articles, reviews, editorials) by French orthopedic surgeons' members of the SoFCOT between 2008 and 2017, as described by Saab et al. [2].

2.1 Indexing of journals and articles in PubMed and transfer to SIGAPS

PubMed indexing is complex, and it is not always possible to distinguish Medline-indexed articles from PubMed articles not indexed in Medline.

Indexing can be identified in two ways:

1) by analyzing the journal: within PubMed, one can reach the National Library of Medicine (NLM) Catalog and, under “Current Indexing Status”, there is an item “Currently indexed for Medline”;

2) by analyzing publication status: in PubMed, each publication has a status [11]: “In-Data-Review”, “In-Process”, then “MEDLINE” or “PubMed-not-MEDLINE”. These correspond to the state of progress in data control ahead of final indexing:

-In-Data-Review: data provided by the editor;

-In-Process: checking title, list of authors, page numbering, etc.;

-MEDLINE: publication meets Medline indexing criteria and is indexed, at which point the MESH terms are also attributed;

-PubMed-not-MEDLINE: publication comes from a journal indexed in Medline without meeting all “MEDLINE” criteria, or else comes from a journal not indexed in Medline.

After several months, an article will have MEDLINE or PubMed-Not-MEDLINE status. The status is available in XML format and is among the SIGAPS data. For example, for an article that has recently become available in PubMed, the status will be: <MedlineCitation Status="In-Data-Review" Owner="NLM">. The French SIGAPS database includes all PubMed-indexed scientific articles published by the 600 Health Establishments with research activity. Based on the physicians' names and initials and PubMed requests, each Establishment manages its publications list. Twice yearly, these are transmitted to the national database for indices to be calculated. The resulting “SIGAPS points” underlie funding of teaching,

research, referencing and innovation missions (“MERRI”). SIGAPS feeds off PubMed; if an article appears in a predatory journal not indexed in PubMed, it will not appear in SIGAPS.

2.2 Data extraction

We extracted status for 6,056 articles from the SIGAPS database: i.e., PubMed in November 2019, when the database was last updated. Only 15 of the 6,056 articles for the period 2008-2017 were still at the Data Review stage; all of the others were either MEDLINE or PubMed-Not-MEDLINE. For the 15, we checked present status, and were thus able to classify all articles as either MEDLINE or PubMed-Not-MEDLINE.

We then included status alongside our other data: list of authors, title, journal, Impact Factor, and SIGAPS category. These data were used to identify potentially predatory journals.

2.3 Identification of predatory journals

Among the 6,056 articles retrieved from SIGAPS, those with PubMed-Not-MEDLINE status and Non-Classified (NC) on SIGAPS were selected as liable to be in a predatory journal. For each article, 2 observers assessed the predatory nature of the journal based on the updated Beall’s list [12] and predatoryjournal.com list updated in 2019 [7]; in case of disagreement, a third observer made the assessment and agreement was reached between the 3.

Journals were deemed predatory if:

- they figured in 1 of the above 2 blacklists;
- or had been labeled predatory in the past.

Otherwise, journals were deemed predatory in case of agreement between the 2 observers on at least 2 of the following 3 criteria:

- journal unaffiliated to any scientific society or university;

- editorial board and or board members' function (hospital affiliation, resume apart from the resume mentioned in the journal) impossible to identify;
- APC not specified despite the journal being in open access.

Predatory status was thus defined according to COPE criteria [13]. Whether the journal was free of charge or not was also noted.

2.4 Statistics

Numerical variables were reported as mean±standard deviation (range), and categorical variables as number and proportion/percentage. No statistical analysis was made of purely descriptive results.

3. Results

Four hundred and fifty-five of the 6,056 articles had PubMed-Not-MEDLINE status (Figure 1); 323 were also SIGAPS category NC. Mean number of authors was 6.2 ± 2.52 [range, 2-12]. None of the journals had impact factors. One hundred and eighty-six articles (58%) involved APCs of \$200-1,500 for a mean of about \$400; total submission cost for the 186 articles came to about \$74,400. On analysis, 290 articles were in journals considered certainly non-predatory: i.e., 89.6% of PubMed-Not-MEDLINE category NC articles. Thirty-three articles (10.4%) were in journals considered predatory: 11 articles in journals on Beall's list, 21 in journals with predatory history (Beall's list 2012) and dubious editorial practices according to Beall and the Stop Predatory Journals group, and 1 in a journal deemed predatory on analysis of its editorial board by the 3 observers (following disagreement between the first 2).

Proportionally to French orthopedic publication volume for 2008-2017, 33 publications in predatory journals out of 6,056 amounts to 0.55%: i.e., a rate of 99.45% publication in non-predatory journals.

The number of PubMed-Not-MEDLINE articles has increased incessantly over the last decade: 17 in 2008, versus 97 in 2017, or a 5.7-fold increase. The rate of publication in predatory journals followed the same trend: none prior to 2010, 1 article in 2010, and a mean 4 per year since 2011.

4. Discussion

There are very few articles published by French orthopedic surgeons in predatory journals, although the rate had been increasing since 2010. At 0.55% of all articles published by SoFCOT members, the rate is marginal, confirming the quality of French orthopedic output. It is highly likely that, in some cases, the authors were not intentionally using a predatory journal to publish their work, but rather lacked awareness about this kind of journal. One unexpected finding was the high cost (an average \$400, or \$74,400 for the 186 PubMed-Not-MEDLINE articles with APCs) borne by orthopedic surgeons to publish in an NC journal earning just 4 SIGAPS points for the first author and correspondingly low MERRI funding (around €550 per SIGAPS point for 4 years) [3,4]. However, it is difficult to foresee the cost of publishing in a predatory journal, as by definition APCs are not specified or detailed at submission. Other reports estimated a mean \$420 publication cost in a predatory journal [14,15], close to our estimate for the 186 PubMed-not-MEDLINE articles with APC.

Resort to predatory journals has been investigated in other specialties [16-19], but less in orthopedics/traumatology. Yan et al. [14] studied 225 potentially predatory journals; in 56.2% of cases, submissions received little if any peer review (single review in 36.5% of

cases). They also found that APCs were much lower in predatory than in legitimate journals, averaging \$420 versus \$2,900. Only Sener et al. [15] assessed predatory journal publication rates in a particular country, finding 2.2% (106 articles) for Turkish orthopedic surgeons between 2000 and 2018.

The present study had several limitations.

1) When articles appeared in journals that did not figure in either of the two blacklists, predatory status was hard to determine, leading to possible underestimation. In case of doubt, however, we applied criteria that are widely described in the literature [13,16,17]:

- frequent email requests to researchers [18];
- unprofessional email address;
- promises of extra-fast publication;
- lack of transparency on peer-reviewing and other publication charges, with lower charges than in more transparent journals [19];
- false impact factor;
- no retraction option;
- false editorial board [20].

Having 2 independent observers plus a third in case of disagreement limited possible selection bias, predatory status being attributed after discussion of the above criteria. This process was needed for only 1 of the 33 articles appearing in predatory journals; in the other 32 cases, the journal was blacklisted or had known predatory status in the past; the method thus limited overestimation of predatory status.

2) We used Beall's List as updated by Stop Predatory Journals. These lists are accessible free of charge, unlike the Cabell blacklist which involves heavy subscription charges, averaging

\$12,000, varying according to country and the size of the author's institution [8]. Moreover, the Cabell criteria are too numerous (65 in all) to allow analysis in case of inter-observer doubt. The various lists are also not always concordant regarding certain publications, as pointed out by Chen et al. [21], who find Beall more "aggressive" than Cabell.

3) The present study covered a limited period, from 2008 to 2017. These dates were chosen in the light of the sharp increase [1] in publication by French orthopedic surgeons since the introduction of *Orthopaedics & Traumatology: Surgery & Research* (OTSR) in 2008 in place of the *Revue de Chirurgie Orthopédique et Réparatrice de l'Appareil Moteur* (RCO). However, in point of fact, we found zero publication in predatory journals before 2010; the practice really began in 2011 [6], so our chosen starting date had no impact on our conclusions. On the other hand, the study needs pursuing over time to check the observed trend for an increase in absolute numbers, as the recent Beall and Cabell lists report considerable increase in the number of predatory journals.

5. Conclusion

Despite a marked increase in the number of predatory journals over the last 10 years, very few French orthopedic surgeons resort to them to publish their work. The difficulty of identifying a predatory journal as such may account for some of these submissions. Teams need to check certain criteria before submitting: a short time to publication or a low APC are not to be seen as an incentive, and any demand for payment coming after acceptance is to be regarded with the greatest suspicion. In case of doubt after analyzing these criteria, the best course of action is to contact the target journal's editorial board directly.

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Author contributions: J. Dartus: data extraction and analysis and article writing; M. Saab: data extraction; P. Martinot: data analysis and re-editing; S. Putman: data analysis and re-editing; R. Erivan: data extraction; P. Devos: database management and study initiation and supervision.

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Figure legends

Figure 1: Flowchart

