

Comparing collaboration: a study into co-authorship behaviour of anaesthetists and surgeons

Jasper M. Kampman*, Markus W. Hollmann, Wietse J. Eshuis and Jeroen Hermanides

Amsterdam, the Netherlands

*Corresponding author. E-mail: j.m.kampman@amsterdamumc.nl

Keywords: anaesthesia; co-authorship; collaboration; publication; randomised controlled trials; surgery

Editor—In medical practice, collaboration can be of vital importance, especially when working in highly specialised places such as the operating room. This teamwork between anaesthetists and surgeons would also be beneficial in research. When collaborating, researchers share ideas and information, create innovations, and increase productivity.¹ Academic collaboration can be assessed by co-authorship analysis, which indicates substantial contributions to study design, interpretation of data, and critical revision.² Previous studies have shown that more extensive and interdisciplinary co-author networks achieve higher quality research.^{3,4}

Despite the evidence in favour of collaboration, we suggest there might be room for improvement in research conducted in the perioperative setting. With this analysis we aim to identify collaboration between anaesthetists and surgeons by studying co-authorship behaviour in research covering their shared field of work.

We identified all RCTs published in the fields of anaesthesia, surgery, and general medicine between January 1, 2018 and December 31, 2018 in the four journals with the highest impact factor in 2017 for each of the three specialties (see [Supplementary data](#)). An article was defined as a shared field research if one or more interventions studied took place during, immediately preceding, or after surgery. An article was scored primarily surgical if the first author was affiliated with a surgical department, and primarily anaesthetic when the first author was affiliated with an anaesthesia department. Lastly, we examined whether an anaesthetist was involved as co-author in the primarily surgical articles and vice versa. Our data were analysed using the SPSS version 25 (SPSS Inc., Chicago, IL, USA). Pearson χ^2 tests of independence and Fisher's exact test were used to test for differences in proportion of anaesthetists and surgeons citing each other with a significance threshold of $P > 0.05$ used for the comparison.

We identified 583 articles, of which 60 were excluded for not being RCTs. Of the remaining 523 papers, 104 were published in anaesthesia journals, 56 in surgical journals, and 363 in general medicine journals. A total of 109 articles met our inclusion criteria for taking place in the shared field between anaesthetists and surgeons. Of those, 69 were primarily anaesthetic of which 22 included a surgeon as co-author (31.9%). The other 40 articles were primarily surgical of which three had an anaesthetist as co-author (7.5%; $P = 0.004$) ([Fig. 1](#)).

The 109 included articles are written by 1061 authors: 18 authors were involved with two articles, one author with three articles, and one with four articles. A geographical sub-

analysis yielded no significant differences in academic collaboration ($P = 0.993$).

Our analysis shows that both anaesthetists and surgeons involve each other as co-authors in a minority of RCTs conducted in the shared field between the two. Most of the articles cover interventions that impact surgical conditions. These studies affect the work in both specialties and would benefit from close collaborations in study design and execution.

Even though both anaesthetists and surgeons can improve collaboration, surgeons have a larger gap to bridge, as in 37 of the 40 surgical papers an anaesthetist was not included as co-author. The majority of these (23 studies) covered operation techniques, of which the largest portion compared open vs laparoscopic or robotic approaches.

The three articles that did include an anaesthetist investigated interventions from the domain of anaesthesia, and two of the three were published in anaesthesia journals. These two covered reducing mortality by performing pre-operative cardiac ultrasound,⁵ and using opioids to shorten the time an epidural is required after surgery.⁶ The third investigated the potential of wound catheters to reduce opioid requirements.⁷ Thus, all of the articles studying

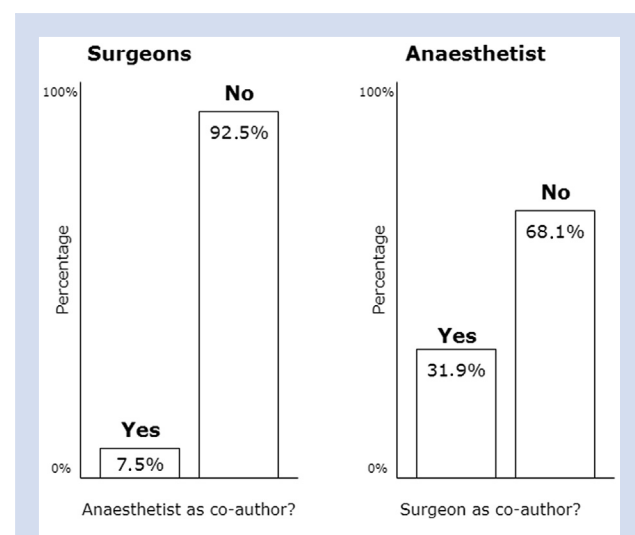


Fig. 1. Proportion of anaesthetists and surgeons including the other as co-author. The difference between the two groups is statistically significant ($P = 0.004$).

exclusively surgical interventions did not include an anaesthetist in the research group. In contrast, the articles from anaesthetists that did include a surgical co-author were diverse in subject matter, including perioperative medication, fluid therapy, pain management, mechanical ventilation, and more.

An explanation for our findings could be that surgeons are the primary treating specialists, facilitated by anaesthetists, and surgeons do not feel the same need for facilitation when performing research. Anaesthetists may, however, feel more inclined to involve surgeons when designing or performing studies because surgeons have leading roles as treating specialists throughout patients' hospital stays. Another explanation may be that, from a research perspective, anaesthesia is a relatively small academic specialty and anaesthetists may sometimes go unnoticed as potential research collaborators.^{8,9} We considered co-publishing the current paper in a surgical journal, but it was rejected based on a flawed deduction that 'just giving anaesthesia to a patient in a trial is not enough to be an author on a paper'. This illustrates our conclusion that the added benefit of academic collaboration is largely unrecognized. We believe, of course, that co-authorship should be earned by making substantial contributions to a study, outlined by the International Committee of Medical Journal Editors (ICMJE) recommendations.² We make a plea for collaboration starting at study design and continuing throughout the study, ultimately leading to co-authorship.

Several limitations to this study should be considered. First, we defined papers being either surgical or anaesthetic in nature by assessing the first author's affiliation. Although this may lead to mislabelling, we do not think that this has influenced our results as the first and last authors differed in specialty in only six of the 109 papers. In three papers the first author was an anaesthetist and the last author a surgeon, and *vice versa* in three papers. Second, our definition of shared field could be discussed, as our approach was to include every study comparing interventions taking place intraoperatively or immediately before or after operation. Third, we included only 109 papers out of the initial 583 search results. The majority of the excluded papers came from the four major general medicine journals, of which only 13 out of a total of 363 RCTs were performed in the perioperative setting.

We believe our observations are timely; increased collaboration, preferably starting at study design, can enhance the quality of research of both anaesthetists and surgeons. Clinical trials are becoming larger and more complex, which may lead to more interdisciplinary collaboration. We predict a future shift towards more intertwined co-authorship networks, reflecting actual research collaboration between anaesthetists and their surgical colleagues. Suggestions for future research are to evaluate and encourage this process as we predict it will lead to higher quality research.

Authors' contributions

Study design: JK, JH

Drafting of the manuscript: JK, JH

Data collection and analysis: JK

Critical revision of the manuscript: all authors

Declaration of interest

The authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.bja.2019.10.018>.

References

1. Fonseca Bde P, Sampaio RB, Fonseca MV, Zicker F. Co-authorship network analysis in health research: method and potential use. *Health Res Policy Syst* 2016; **14**: 34
2. International Committee of Medical Journal Editor (ICMJE) Recommendations, last updated December 2018. <http://www.icmje.org/recommendations/> (accessed 24 September 2019).
3. Li M, Zhuang X, Liu W, Zhang P. More stable ties or better structure? An examination of the impact of co-author network on team knowledge creation. *Front Psychol* 2017; **8**: 1484
4. Mayrose I, Freilich S. The interplay between scientific overlap and cooperation and the resulting gain in co-authorship interactions. *PLoS One* 2015; **10**, e0137856
5. Canty DJ, Heiberg J, Yang Y, et al. Pilot multi-centre randomised trial of the impact of pre-operative focused cardiac ultrasound on mortality and morbidity in patients having surgery for femoral neck fractures (ECHONOF-2 pilot). *Anaesthesia* 2018; **73**: 428–37
6. Schneider MP, Löffel LM, Furrer MA, et al. Can early oral prolonged-release oxycodone with or without naloxone reduce the duration of epidural analgesia after cystectomy? A 3-arm, randomized, double-blind, placebo-controlled trial. *Pain* 2018; **159**: 560–7
7. Karanicolas PJ, Cleary S, McHardy P, et al. Medial open transversus abdominis plane (MOTAP) catheters reduce opioid requirements and improve pain control following open liver resection: a multicenter, blinded, randomized controlled trial. *Ann Surg* 2018; **268**: 233–40
8. Hurley RW, Zhao K, Tighe PJ, Ko PS, Pronovost PJ, Wu CL. Examination of publications from academic anesthesiology faculty in the United States. *Anesth Analg* 2014; **118**: 192–9
9. Reves JG. We are what we make: transforming research in anesthesiology: the 45th Rovenstine Lecture. *Anesthesiology* 2007; **106**: 826–35

doi: 10.1016/j.bja.2019.10.019

Advance Access Publication Date: 27 November 2019

© 2019 British Journal of Anaesthesia. Published by Elsevier Ltd. All rights reserved.