



Clinical studies and research integrity

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Editors and reviewers of neurosurgical journals encounter bizarre articles from time to time. Articles can be bizarre in many ways. For an editor of a neurosurgical journal, articles that are out of scope can appear bizarre. I have rejected papers on general surgery or proctology submitted to *Acta Neurochirurgica*. Occasionally, bizarre articles can reflect ailing mental health. Lately however, we have encountered a new phenomenon: articles that address core neurosurgical themes and contain terminology, results, and a discussion that appear professional at first glance. At second glance, however, one wonders if one is subject to a practical joke. The pieces do not fit. We can see examples in articles available on-line. Some, but not all, were retracted. One example is [6] where authors seem to have made up a universe of data and parameters where terminology includes Fisher grades I–V and differentiates between “single” and “multiple shots” aneurysms—their numbers do not add up. Moreover, data were not traceable at all. Sources were described as “the data of 125 aSAH cases admitted to a hospital.” Another example of a bizarre concoction is [7] traceability is absent; background description is faulty and results incomprehensible and internally contradictory. For example, deeply comatose patients were described to have Bartel Indices compatible with “moderate need of assistance” for activities of daily living. These examples are retracted articles, where the publisher “could not guarantee the integrity of the articles.” Importantly, the literature on research fraud deals with retracted articles [3] while many problematic articles are detected and rejected during editorial work.

As a journal editor, I see many articles with similar faults that I do not send for review. This phenomenon has developed and increased over the past years. A new term has been

coined, “paper mills.” The Committee on Publication Ethics defines these as “profit oriented, unofficial and potentially illegal organizations that produce and sell fraudulent manuscripts that seem to resemble genuine research” [2].

Of course, it may be impossible to detect a paper mill product during editorial management and review, but surprisingly, many paper mill products share a structure of generic hypotheses, poorly described backgrounds, and data that strike an expert as unrealistic or even contradictory. Most importantly, patients and data are not easily traceable, and it is not clear from reading the manuscripts where one would have to go to validate data. Although editors of specialty journals who are experts, such as the neurosurgeons who edit journals such as *Neurosurgery*, *Journal of Neurosurgery*, *Neurosurgical reviews*, *World Neurosurgery*, *Acta Neurochirurgica* and others, can spot bizarre neurosurgical claims to a different degree than editors of platform journals where business is driven by article processing fees and rapid handling by many non-experts, and where decisions to publish are not necessarily made by medical editors. Still, imaginary patients can be fabricated by medical experts, in which case obvious red flags may be missing or difficult to see [5]. A highly regarded neurosurgeon, Julio Cruz, wrote an influential paper on high-dose mannitol for resuscitation of severely head injured patients, and papers that made an impact were cited in guidelines. Yet, patients underlying studies have not been identified, and it remains unclear where studies were carried out.

The bottom line is that traceability of experimental data includes traceability of patients in clinical research. In this issue of *Acta Neurochirurgica*, Autio et al. [1] pave for a paradigm shift in neurosurgical research. They publish data with radiological panels. I believe such publishing is a remedy for research with non-traceable clinical research. Moreover, results become understandable and applicable to a completely new extent. Everyone who reads clinical papers based on figures and verbal description must guess what the patients “actually looked like” and may miss important clinical inference when not seeing images the way they do in everyday clinical practice. Personally, I have wondered about interpretation of the STICH-trials [4]. It was a trial where neurosurgeons

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could randomize patients, if at equipoise whether surgery or conservative management would be best indicated. Inclusion criteria allowed inclusion of patients with hemorrhages of 20 ml. It may sound adequate, yet, I believe most surgeons would be convinced that such a small hemorrhage could never benefit from surgery once they see the images. Neurosurgeons of today are dependent on images and undoubtedly scans of a diseased brain evoke a complex where an experienced neurosurgeon can guess a patient's clinical condition, prognosis, and potential treatment.

The suggestion by the Kuopio team to include this kind of information is novel and visionary. We can gain additional information, improving neurosurgical communication, and we may be able to prevent many instances of fraud.

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