

# Case Reports and Case Series in the Era of Evidence - Based Medicine

## Relatos e Série de Casos na Era da Medicina Baseada em Evidência

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### ABSTRACT:

Case reports and case series are important parts of the medical literature that continue to have their place in scientific journals. Frequently they are the first evidence for new therapies. Reports of cases and series are considered a low level of evidence their various arguments for and against their use in the incorporation of new treatments. Creative and critical use of these studies can increase a historical value by enriching the practice of medicine. The “methodology” used to report cases and the topics chosen to reflect our growing pragmatic approach in relation to evidence and arguments related to medicine and other health sciences.

**Key words:** Case reports; Case series; Reports methodology.

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### ARTICLE

During much of medicine’s history case reports were the only source of scientific information. Most of the principles of the main surgical techniques that persist today came from contribution from this type of study. As an example, we cite cesarean section – the most frequently performed surgery in the world – which improved over time based almost exclusively on case reports.

With the emergence of evidence-based medicine, this type of study became the “ugly duckling” of the medical literature, and indeed many journal editors avoid publishing case reports. The case report is the type of study that most associated with the clinician; it sharpens the interpretation of signs and symptoms and is great material for discussions that stimulate learning among young doctors.

These days the pressure for those in academic careers to publish in scientific journals is greater than ever. The rallying cry among researchers in academia is “*publish or perish.*” In this competitive climate, exacerbated by journals accepting such articles, some academicians distort the purpose of case and series

reports, and gravitate to them because they are considered easier and quicker to elaborate and write. With this, there are growing numbers of case report articles of low-quality and of limited value to the scientific community

This study design has and will continue to have considerable value and guaranteed space in research, but we should know when to carry them out and what care should be taken with them.

Even today, case and series reports remain an important part of medical journals and continue to be published in various prestigious journals such as *The Lancet* and the *New England Journal of Medicine*. Generally, such articles are the first reports evidence for new treatments (surgical or medical) and for the identification of rare adverse effects of medications.<sup>1</sup>

Although the distinction between the two types of studies is subjective and debated by scholars, a case report typically does not include more than three cases, while a case series is understood to include anywhere from three to ten cases according to some authors and potentially more than that this number according to other authors.<sup>2</sup>

Case reports are a detailed description of clinical cases containing important details about signs, symptoms, and other patient characteristics, and report the therapeutic procedures used, as well as the outcome of the case. Such reports are clearly indicated in cases of rare diseases, especially those for which neither the diagnosis nor the treatment are yet clearly established in the scientific literature.

In a hierarchical order with regard to level of evidence, case reports and case series rank below clinical trials (Table 1). Exactly for this reason, a study of this type should only be published in a specialized journal when it meets well-defined goals and objectives. A good case report should have the objective of conferring some benefit either to current clinical practice or by identifying possible new directions for research of a specific theme in which one or a few individuals can be representative. Such cases would propose innovative approaches to diagnosis or treatment, or how to formulate hypotheses that can be tested using other study designs. In addition, in certain situations, a case report is an initial study which becomes the basis for the elaboration of larger studies.<sup>3</sup> Case reports are also important as they permit the accumulation of cases which create the conditions for the early perception of a new or resurgent epidemic.

Clear indications for case series reports include: the detection of epidemics, to describe the characteristics of new diseases, to formulate hypotheses about possible causes of a disease, to present results of therapies for rare diseases, and to report rare adverse effects in common diseases. The principal disadvantages of these studies include: conclusions based on few cases, not being sure that

you have a representative sample, not having a methodology capable of validating a causal relationship, not having any control group for comparison, not quantifying the prevalence in the population, and a diagnostic methodology that is not standardized.

Case reports classically have great importance in rare diseases. This is due to the fact that the compilation of a certain number of cases is practically impossible in any single study. Treatments are evaluated with regard to success or failure in a single individual and knowledge acquired from this “trial and error” is applied to the next case. A recent example was the use of a novel treatment for rabies that was initially tested in the United States that generated the first case of survival with established disease<sup>5</sup> which then was used in two more cases, including one in Brazil, widely reported by the press.

The conclusions that can be taken away from the studies are generally limited by the small number of individuals and because of the absence of a control group. The efficacy of the treatment can only be demonstrated under the rarest of circumstances: when no other treatment is available and the improvement is dramatic. Case reports can never be used to demonstrate the safety of a treatment or intervention because of the rarity of some side effects. The main problem with the use of case reports to support a novel therapy is that generally only case reports of cases that were successful are published, which constitutes a publication bias. One study found that more than 90% of case reports published in a particular period referred to positive outcomes.<sup>3</sup>

Besides the fact that they are considered a lower level of evidence, case reports are less

**Table 1** – Levels of evidence according to type of study for treatments and prevention programs. (YUSUF et al, 1998)<sup>4</sup>.

Level	Type of study
1a	Systematic Revision of homogeneous of randomized controlled trials
1b	Randomized controlled trials with narrow confidence intervals
2a	Systematic Revision of homogeneous cohort studies
2b	Cohort study or clinical trials of limited methodologic rigor
2c	Ecologic study
3a	Systematic Revision of homogeneous case-control studies
3b	Case-control study
4	Case series report or cohort studies and case-control studies of limited methodologic rigor
5	Opinion of specialists

frequently cited by authors as compared with other studies such as clinical trials and meta-analyses. In the unbridled quest for a higher impact factor (an indicator of the influence of a scientific periodical), editors of the most important journals have largely discredited case and series reports, only publishing those that are considered really relevant and that contribute advances to a given subject.<sup>6</sup>

Gynecology is replete with advances that can be attributed to case and series reports. Endometriosis was first described by Rokitansky in 1860<sup>7</sup> in cases reports, and our understanding of the pathogenesis of this disease stems from observations Sampson described in case reports of his patients.<sup>8,9</sup> Stein and Leventhal described polycystic ovarian syndrome in 1935 based on the data of seven patients, which constituted an elegant example of a case series.<sup>10</sup> Case reports can be the initial alarm about side effects not seen in animal and human trials. The most notorious example of this was thalidomide, a drug licensed for the treatment of nausea in pregnancy. With the initial case report<sup>11</sup> and, later with various others, its teratogenicity was demonstrated, and soon after it was withdrawn from the market. In our field, the first report of laparoscopic treatment of cervical cancer with lymphadenectomy in Brazil was published in this journal in the 1990s.<sup>12</sup> The etiology of endometrial osseous metaplasia was described by our group in 2009 in a case series report<sup>13</sup> that was published in *Obstetrics and Gynecology*, the most influential journal of the specialty, which demonstrates that there is a place for these studies in high quality publications.

In summary, a good case report should have five attributes:<sup>3</sup>

1. It addresses an important issue;
2. It raises a single interesting question that is clearly formulated so it can be answered;
3. The article presents the case follows a standard structure (that will be described below);
4. Written in a way that is compatible with the journal chosen for publication;
5. Presents conclusions and answers consistent with the limitations of a case report.

After making the decision to write a case report right, the author that is convinced that study will be relevant to the scientific community and not just following the impetus to publish another article, should do it in the most elaborate way possible. Although criteria that should be used – such as a *checklist* – prior to writing a case report and the

bases for evaluating the quality of the case report are not well defined in the literature, and despite the fact that the search for methodologic errors in a type of article in which the methods are very flexible and whose principal characteristic is “absence” of planning is quite difficult, we will still try to provide key points.

The case should be described with all the relevant details yet in a succinct way. The description should include age, sex, clinical history, comorbidities, and the clinical outcomes of interest. The intervention, if there is one, should be described in sufficient detail so that it may be reproduced by other researchers. If it concerns a medication, one should describe the dose, the frequency of administration, and the duration of treatment. Elements that demonstrate quality in a case report are:

1. Clearly defined diagnostic criteria;
2. Informed consent from all described patients;
3. Approval from the Ethics Committee for a prospective case series;
4. Details of the intervention (drug or surgery, for example) are described;
5. Clearly defined and relevant clinical outcomes;
6. Description of the perception of the patient with regard to the intervention performed and the clinical outcome;
7. Description of the risks associated with the intervention;
8. Clearly defined inclusion and exclusion criteria;

In relation to this final item, we should note that case reports don't have methods and most include only a single case. A REPORT is not RESEARCH, because it is not planned. A case worthy of being reported is something that falls into the lap of a clinician by chance.

In conclusion, the main question that should be asked by someone considering reporting a case or a series of cases is: am I contributing in a substantial way to the understanding and treatment of this disease or to a NEW disease? If the answer is affirmative, every care should be taken to present the cases in the most ethical and constructive way for the management of a given infirmity, limiting our conclusions to that which is possible with the study design in question.<sup>14,15</sup> More elaborate and conclusive answers should be left to studies with higher levels of evidence that may

carried out in the future. If the answer is negative, one should not seek publication only as a form of personal triumph that will contribute little to science. Of course, for those who choose this selfish path, there's always the editor-in-chief of the most influential journal who can reject studies that would not contribute to science. International journals with a high impact factor only accept unprecedented case reports that have the potential to challenge current theories about the etiopathogenesis of the disease or that bring to light an innovative treatment. Case reports often are nothing more than "medical curiosities" that from a practical standpoint do not add to our understanding

of the disease in question. Many are published by authors that are not part of a research group focused on a well-defined problem.

These studies have and will continue to have their place in the literature even with all the new intricate statistical methods and with the supremacy of clinical trials and meta-analyses in the hierarchy of evidence. But it is incumbent upon researchers and journal editors to not transform case reports into an object of personal accomplishment and the conquest of goals to fulfill rigid publication goals now applied to all those involved in research pursuing advancement in their careers.

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#### RESUMO:

Relatos e série de casos são integrantes importantes da literatura médica e continuam a terem seus espaços nas revistas científicas. Frequentemente, eles são a primeira evidência para novas terapias. Relatos e série de casos têm pequeno nível de evidência e há vários argumentos contra o uso deles para a instituição de novas terapias. O uso criativo e crítico destes estudos pode aumentar seu valor histórico no enriquecimento da experiência na medicina. Sua "metodologia" e tópicos devem ser desenvolvidos sob a luz da nossa crescente abordagem pragmática em relação às evidências e argumentações de assuntos relacionados à medicina e outras ciências da saúde.

**Palavra chave:** Relato de caso; serie de casos; metodologia de relatos.

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## REFERENCES

- Albrecht J, Werth V, Bigby M. The role of case reports in evidence-based practice, with suggestions for improving their reporting. *J Am Acad Dermatol* 2009;60:412-8.
- Albrecht J, Meves A, Bigby M. Case reports and case series from *Lancet* had significant impact on medical literature. *J Clin Epidemiol* 2005;58:1227-32.
- Jenicek M. Clinical case reports and case series research in evaluating surgery. *Med Sci Monit*, 2008; 14(10): RA149-162.
- Yusuf S. *Evidence-Based Cardiology*. London: BMJ Publishing Group, 1998.
- Willoughby RE Jr, Tieves KS, Hoffman GM, Ghanayem NS, Amlie-Lefond CM, Schwabe MJ. Survival after treatment of rabies with induction of coma. *N Engl J Med* 2005; 352(24): 2508-14.
- Patsopoulos NA, Analatos AA, Ioannidis JP. Relative citation impact of various study designs in the health sciences. *JAMA* 2005;293:2362-6.
- Von Rokitsansky C. Ueber uterusdrusen-neubildung in uterus and ovarilsarcomen. *Z Ges Aerzte Wein* 1860; 37: 577-93.
- Sampson JA. Ovarian hematomas of endometrial type (perforating hemorrhagic cysts of the ovary) and implantation adenomas of endometrial type. *Boston Med Surg J* 1922; 186: 445-73.
- Sampson JA. Peritoneal endometriosis due to menstrual dissemination of endometrial tissue into the peritoneal cavity. *Am J Obst Gynecol* 1927; 14: 442-69.
- Stein IF, Leventhal ML. Amenorrhea associated with bilateral polycystic ovaries. *Am J Obstet Gynecol* 1935;29:181-91.
- Joki T, Vaananen I. Thalidomide and embryopathies. Report of 2 cases. *Duodecim* 1962;78:822-7.
- Oliveira M, Oliveira H, Melki L. Tratamento do câncer de colo por laparoscopia. *Femina* 1997; 25(10): 873-80.
- Parente RC, Patriarca MT, de Moura Neto RS, de Oliveira MA, Lasmar RB, de Holanda Mendes P, de Sá PG, Cardeman L, Silva R, de Freitas V. Genetic analysis of the cause of endometrial osseous metaplasia. *Obstet Gynecol*. 2009 Nov; 114(5):1103-8.
- Fletcher RH, Fletcher SW, Wagner E. *Epidemiology Clínica: Elementos Essenciais*. 3 ed. Porto Alegre: ArtMed; 1996.
- Hennekens CH, Buring JE, Mayrent SL. *Epidemiology in medicine*. 1st ed. Boston: Little, Brown; 1987.

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