Editorial

Are medical breakthroughs declining – The importance of case reports?

A R T I C L E   I N F O

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A B S T R A C T

Case reports are a valuable though oft-underestimated source of clinical knowledge, even wisdom. They are extremely valuable to clinicians faced with new diseases, new investigations, and new therapies, where they provide the initial information, which serves as a basis to plan a detailed comparative study to provide definitive answers. The publication of cases and images-related reports is undoubtedly a gain for all, including medical students, medical teachers, the scientific community, medical professionals, healthcare managers, and patients.

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1. Introduction

We currently live in a scientific context where great discoveries, especially in medicine, are not as common as earlier say 19th or early 20th century. Despite increasing pharmaceutical R&D efforts, times, costs, and spending, these efforts are not being reflected in the numbers of new drugs being brought to the market.1 It is as a matter of fact, widely reported that there has been a decline in the rate of development of new drugs over past several decades.2,4 Not only in new drug or disease discovery, almost everything we know today about etiology of diseases was discovered way back. The 2nd half of the twentieth century belonged to pathogenesis, to clarify the molecular mechanisms and possible new associations (more subtle) between exposure and disease. Herein, case reports played a stellar role, focusing on rare, unusual, new, and/or unknown diseases, as well as change the natural history of a particular disease, in addition to reports on new treatments, both medical & surgical and complications associated with them. A case in example, 1st successful CABG procedure was performed by Rene Favaloro of the Cleveland Clinic in 1968. Favaloro’s report fired the imagination of many surgeons who started operating initially, on stable patients but as skill was acquired on ever-sicker patients, and even during MI.5 By 1977, cardiac surgeons were performing 100,000 bypass procedures per year based only on case reports with no single trial available, based only on the logic of the procedure which was self-evident, “you have a plugged vessel, you bypass the plug, and you fix the problem, end of story.” Like CABG, PCI rates also went from zero to 100,000 procedures in no time with no clinical trial: based just on the logic of the procedure and patients’ reports of how much better they felt. While this kind of practice may also not be justified, it is indeed reasonable that case reports be considered useful tools in generating hypotheses triggering conducting observational studies such as cohort, case-control, and cross as well as experimental studies and clinical trials, according to the nature of the case presented in the report (basic as well as clinical).

2. The switch from case reports to original studies/trials

Knowledge about anything can only be gained by two ways. One way is by searching for similitude or resemblances (integration) so that an entity is observed in entirety of process and then its similarities to other already known process identified a process that happens when a single case or a group of cases is studied over a period of time.6 Finding similarities
with other diseases allows discovery of some common truths. The limitation of this technique is that some false assumptions may be made based on assumed similarities, which may really not exist as a matter of fact. This method of gaining information essentially relies on intuition. The other way to gain knowledge is that by comparison (differentiation), where two processes are compared and the differences brought out. This is the process followed in original studies or trials where a natural history of disease may be compared with health or a treatment modality is compared with a placebo or even another treatment modality. The process gives accurate information but it has several limitations as well.

1. The number of subjects required to give a meaningful result may be huge especially if expected difference is small – some trials requiring 1000s or even 100,000s of subjects.
2. The cost and logistics involved may be huge.
3. However, the biggest limitation is perhaps that the results are applicable only in that limited context. For example, Newtonian physics is applicable only on the surface of earth and it goes completely haywire when this context is lost, for example, in space where only Quantum Physics works. In other words, the results may not be widely applicable to Real World Scenario but are specific to trail settings and if one has to apply them in real world setting, some degree of intuition (rather than pure evidence) is indeed required.

Unfortunately, after the advent of so-called evidence-based medicine in the late 1980s, the descriptive studies lost favor and have been considered by the academic community as a kind of evidence of lower hierarchy in relation to RCTs. Not surprisingly, the number of published case reports started declining; for example, in the British Medical Journal, there were 149 case reports in 1990, but only 37 in 2005.7

### 3. What is the value of case reports in medicine?

Historically, case reports have proven extremely valuable to clinicians faced with new diseases, new investigations, and new therapies. But faced with objectivity and exactitude, many researchers (evidence based) argue that the obscure nature of many case reports makes them of little value to the average researcher. Not only that they are rarely considered for development of guidelines where randomized clinical trials (RCTs) “rule the roost”, the fact that these guidelines may be completely deficient in certain areas (where the RCT was not conducted for several reasons) does seem to bother anybody at all.8 These guidelines value measurable, reproducible proof (evidence) much more than individual experience. Not surprisingly, case reports typically receive fewer citations than research articles, putting them in danger of being phased out from journals where citation data rules and where “impact factor” is the material God. However, leaving aside impact factor, there are several advantages to the practicing physician. They may:

1. Serve as the initial scientific material for any new disease, diagnosis, or even treatment (a value to even clinical researcher).
2. They are very useful tools of information for busy practitioners, providing them elements that undoubtedly assist in the care of their patients. Reading the details of the reports certainly update their knowledge as well as ability to treat because these cases are real world patients (and not ideal, artificial study setting), which have clinical details much in common to their own patients.
3. They have an important role in medical education, i.e. the training of medical students and residents of all clinical areas of medicine, helping them learn new techniques, and gain skills of treating intriguing case comprehensively.
4. Aid in gaining professional experience as a featured element in medical decision making, especially considering the safety of the patient and the proposed treatment, as well as the natural history of the disease.

### 4. Conclusions

Thus, even though many will not agree with our decision to have a special supplement focused on case reports, “this is a retrograde step,” they might say, we sincerely believe that dedicating an entire issue to case reports will ensure that these valuable stories will be told, rare pathologies and new diseases discovered but more importantly unusual presentations of a common disease elucidated. Even unique and specific outlier case report can be valuable to both researchers and clinicians – signaling adverse drug interactions or symptoms of disease that may be overlooked otherwise. Finally, value of case reports in describing new procedural techniques can never be emphasized. Many of us (who practice intervention cardiology) will fondly remember how we used to read a new (then) technique, be it of PTMC or retrograde BMV from Catheterization and Cardiovascular Diagnosis, as it was known then.

### Conflicts of interest

The author has none to declare.

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FURTHER READING

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