Case reports and case series versus modern evidence-based medicine: Merit for an individual patient and public health

Ekamol Tantisattamo

ABSTRACT

Abstract is not required for Editorial

International Journal of Case Reports and Images (IJCRI)

International Journal of Case Reports and Images (IJCRI) is an international, peer reviewed, monthly, open access, online journal, publishing high-quality, articles in all areas of basic medical sciences and clinical specialties.

Aim of IJCRI is to encourage the publication of new information by providing a platform for reporting of unique, unusual and rare cases which enhance understanding of disease process, its diagnosis, management and clinico-pathologic correlations.

IJCRI publishes Review Articles, Case Series, Case Reports, Case in Images, Clinical Images and Letters to Editor.

Website: www.ijcasereportsandimages.com

(This page in not part of the published article.)
Case reports and case series versus modern evidence-based medicine: Merit for an individual patient and public health

Ekamol Tantisattamo

Medicine is a science which is used by clinicians to heal patients. At the same time, the patients teach their doctors. Since directly contacting their patients, doctors may encounter with different unusual clinical presentations of common diseases or even common manifestations of rare diseases. These experiences have been expressed as case reports or case series as one of the teaching tools to assist young physicians and colleagues to apply the information for other patients who encounter with similar scenario. Today’s practicing medicine requires evidence-based medicine to be cooperated into medical practices and the majority of the evidences are resulted from more complex research study designs including analytic and experimental studies. However, it is common that the original idea or motivation to conduct these types of research studies are based on case reports or case series. Some may believe in hierarchical value of evidence with the lowest one are case reports or case series. Several aspects of case reports or case series and evidence-based medicine are different, but the goal of these are to enhance medical knowledge and subsequently improve patient care. Therefore, case reports and case series remain contributing to medical knowledge and even originate new knowledge. This editorial aims to emphasize several important aspects of case reports and case series from general sense for managing individual patient through their impacts on public health aspect.

Several scientific knowledge arise from observation of people and scientists. Sir Isaac Newton studied and worked on the theory of gravity from observing a fall of an apple [1]. Many invention came from inspiration. Wright brothers dreamed to fly after having a toy helicopter [2]. In addition, the previously unsuccessful experiments make scientists to further observe and research. Thomas Alva Edison who was not the first light bulb inventor, but was the first inventor of the light bulb, which can be used in a practical way, successfully invented a light bulb after several people failed to do so at that time [3].

Similar to any scientific fields, medical knowledge started from an observation from a single patient who has unusual presentations of common diseases or even usual presentations of uncommon conditions. Documentation and sharing experiences about the things that are still unclear lead the young generation to extend that knowledge to become more evidence and innovation.

Among non-experimental studies, case reports and case series are the most basic type of the study, but they are often the fundamental knowledge of all other types of non-experimental studies including case series, cross sectional, case-control, or cohort studies and experimental study like clinical trial [4] (Figure 1).
Nowadays, medical knowledge progresses continuously and rapidly. Medical research from different study designs including case reports and case series can bring different values to medical fields in different ways. The goal of these studies is to discover and add on to new medical knowledge. However, there are some different aspects that unique for each study design (Table 1).

All clinicians and healthcare providers practice and learn from their patients. Most clinicians consult their colleagues or specialists whenever they encounter with unclear clinical situations in terms of clinical manifestations, diagnosis, interpretation of laboratory data or investigation, and management particularly in the setting of rare conditions or diseases as well as rare manifestations in common diseases. Nevertheless, uncertainties sometimes remain. Previously published clinical case reports or case series are therefore other resource that are helpful to assist in their clinical decision making.

Not only the benefit of case reports to help in the management for a single patient, they also potentially extend the benefit to societies at large or even to public health. The recent example that emphasizes this benefit is Zika virus epidemic. A clinical case report [5, 6] can lead to subsequent analytic studies to characterize clinical manifestations, investigations, transmission, and complications of Zika virus infection in human and further studies during Zika virus outbreak [7–13] as well as discovery of management and prevention such as vaccine [14, 15].

Several values of case reports and case series are not only contributing to the field of medicine, but also impacting or changing regulation or even public health policy. Particularly, the initial step of analytic research for drug safety often starts with case reports or case series [16]. This can be demonstrated by one of the new field of public health, pharmacoepidemiology involving in drug utilization, effectiveness, and safety. With so many innovative drugs, biological, biosimilars, or medical devices undergoing accelerated approval process, uncertainties and uncovered information particularly adverse drug experiences (ADE) or unintended side effects may arise. For instance, a report of new or unusual ADE can guide drug consumers, providers, manufacturers, and governmental organizations responsible to the regulation of drug utilization, effectiveness, and safety like Food and Drug Administration (FDA) to be alerted. This subsequently leads to further investigation, conducting research to prove the causal inference of the ADE and drug utilization. Ultimately, the action of these research leads to new regulation and management of the drug utilization for the public [17–21].

Therefore, case report and case series are actually the origin of several observational and experimental studies and can expand observation from characteristics of a single or multiple cases to more complex studies and eventually evidence-based knowledge, which can be applied for patient care through public health. The experiences from this application can subsequently lead to further observation of unknown knowledge requiring additional processes of obtaining knowledge from self-study, consultation, or research. This becomes a “cycle of medical knowledge” as demonstrated in the Figure 1.

Although several merits of case reports and case series, some disadvantages may take into the consideration when utilizing the information from case reports or case series mainly due to limitation of making causal inferences from a small number of studied patients (Table 2).

### Table 1: Comparison between case-based studies and modern evidence-based medicine

<table>
<thead>
<tr>
<th></th>
<th>Case-based studies</th>
<th>Modern Evidence-based Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examples</strong></td>
<td>- Case reports</td>
<td>Observational studies</td>
</tr>
<tr>
<td></td>
<td>- Case series</td>
<td>- Cross sectional study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Case-control study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Cohort study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Experimental studies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Clinical trial</td>
</tr>
<tr>
<td><strong>Background or motivation</strong></td>
<td>Typical presentation of rare diseases/conditions or uncommon presentations in common diseases/conditions</td>
<td>Determine relationship or causal inference</td>
</tr>
<tr>
<td><strong>Aim</strong></td>
<td>Improve medical knowledge [18].</td>
<td></td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td>Single or several cases</td>
<td>Groups of patients</td>
</tr>
<tr>
<td><strong>Application to regulation and policy</strong></td>
<td>May lead to prompt changing e.g. drug safety and withdrawal</td>
<td>Takes time to collect data and conduct studies</td>
</tr>
<tr>
<td></td>
<td>Common presentation as clinical vignette for house staff and physicians in almost all levels of scientific meetings.</td>
<td>Evidence-based medicine</td>
</tr>
<tr>
<td><strong>Medical education</strong></td>
<td>Lesson for healthcare providers Available resource for consultation</td>
<td>Extend evidence to become more analytic and experimental studies.</td>
</tr>
</tbody>
</table>

### CONCLUSION

From the past, nowadays, and in the future, case reports and case series tell us the stories and clinical entities of rare conditions or diseases or rare presentations of the common diseases. They are also the foundation of many descriptive as well as analytic studies and eventually experimental trials. Case reports and case series can not only be a way to help and communicate other physicians and healthcare providers about unusual aspect of individual case or a small group of patients, but...
also a foundation of idea and motivation in conducting. In addition, case reports and case series are also another method to formally inform involved and responsible stakeholders to further examine and again conduct further more complex research studies to determine causal inferences and this subsequently leads to further action and regulation to ultimately improve patient care. Therefore, case reports and case series should remain one of the efficient tools to inform and educate our colleagues, extend further medical knowledge for patient care, and potentially involve in public health.

**Keywords:** Case reports, Case series, Modern evidence-based medicine, Pharmacoepidemiology, Public health

**How to cite this article**


Article ID: Z01201708ED10010ET

doi:10.5348/ijcri-201710-ED-10010

**Author Contribution**

Ekamol Tantisattamo – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

**Guarantor**

The corresponding author is the guarantor of submission.

**Conflict of Interest**

Authors declare no conflict of interest.

**Copyright**

© 2017 Ekamol Tantisattamo. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

---

### Table 2: Common values of case reports or case series

<table>
<thead>
<tr>
<th>Main value</th>
<th>Comments</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Values</strong></td>
<td>Generating new hypothesis, knowledge and changing medical practices</td>
<td>History of medicine changing knowledge or medical practices</td>
</tr>
<tr>
<td></td>
<td>A tool to communicate among medical professionals</td>
<td>Published case report, case series, letter, or brief communication</td>
</tr>
<tr>
<td></td>
<td>Common way to teach medical trainees</td>
<td>Integration for teaching since pre-clinical years through all of medical professional careers as well as lesson to avoid repeated pitfalls</td>
</tr>
<tr>
<td></td>
<td>Promoting scholarly activity for medical trainees</td>
<td>Special case report sessions for trainees in several specialty medical scientific meetings</td>
</tr>
<tr>
<td></td>
<td>Foundation of more complex medical research</td>
<td>A motivating factor to conduct further complex observational and experimental medical research to determine causal inferences</td>
</tr>
<tr>
<td></td>
<td>Alternative way for experimental studies</td>
<td>Unethical to conduct randomized clinical trial Study of rare diseases or condition</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Public regulation</td>
<td>Initial trigger for drug utilization, effectiveness, and safety in pharmacoepidemiology</td>
</tr>
<tr>
<td></td>
<td>Unable to make causal inferences</td>
<td>Lack of quantitative data, epidemiologic and statistic methods</td>
</tr>
<tr>
<td></td>
<td>Anecdotal fallacy [21]</td>
<td>Over interpretation and personal emotional aspect of the readers [4].</td>
</tr>
<tr>
<td><strong>Biases</strong></td>
<td>Subjective</td>
<td>Incomplete information from a retrospective in nature</td>
</tr>
</tbody>
</table>

---
REFERENCES


Edorium Journals: An introduction

About Edorium Journals
Edorium Journals is a publisher of international, high-quality, open access, scholarly journals covering subjects in basic sciences and clinical specialties and subspecialties.

Invitation for article submission
We sincerely invite you to submit your valuable research for publication to Edorium Journals.

Why should you publish with Edorium Journals?
In less than 10 words: “We give you what no one does”.

Vision of being the best
We have the vision of making our journals the best and the most authoritative journals in their respective specialties. We are working towards this goal every day.

Exceptional services
We care for you, your work and your time. Our efficient, personalized and courteous services are a testimony to this.

Editorial review
All manuscripts submitted to Edorium Journals undergo pre-processing review followed by multiple rounds of stringent editorial reviews.

Peer review
All manuscripts submitted to Edorium Journals undergo anonymous, double-blind, external peer review.

Early view version
Early View version of your manuscript will be published in the journal within 72 hours of final acceptance.

Manuscript status
From submission to publication of your article you will get regular updates about status of your manuscripts.

Our Commitment

Six weeks
We give you our commitment that you will get first decision on your manuscript within six weeks (42 days) of submission. If we fail to honor this commitment by even one day, we will give you a 75% Discount Voucher for your next manuscript.

Four weeks
We give you our commitment that after we receive your page proofs, your manuscript will be published in the journal within 14 days (2 weeks). If we fail to honor this commitment by even one day, we will give you a 75% Discount Voucher for your next manuscript.

Favored author program
One email is all it takes to become our favored author. You will not only get 15% off on all manuscript but also get information and insights about scholarly publishing.

Institutional membership program
Join our Institutional Memberships program and help scholars from your institute make their research accessible to all and save thousands of dollars in publication fees.

Our presence
We have high quality, attractive and easy to read publication format. Our websites are very user friendly and enable you to use the services easily with no hassle.

Something more...
We request you to have a look at our website to know more about us and our services. Please visit: www.edoriumjournals.com

We welcome you to interact with us, share with us, join us and of course publish with us.

CONNECT WITH US

This page is not a part of the published article. This page is an introduction to Edorium Journals.