
The Case Report: A Tool for the Toxicologist

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Perhaps the most exciting aspect of practicing as a medical toxicologist is the likelihood of encountering a truly bizarre clinical scenario on any given day. Unlike other medical specialists, the toxicologist deals only peripherally with natural illness. Our “bread and butter” is the toxic effect of xenobiotics, often when taken in doses never intended and, more important, rarely studied. Although we also manage common and anticipated adverse effects of pharmaceuticals, we are equally likely to encounter idiopathic drug effects, such as hypersensitivity reactions or neuroleptic malignant syndrome, or events resulting from drug interactions, like serotonin syndrome. And of course, there is the vast variety of environmental exposures, envenomations, and various routes of self-administration of commercial and household products.

Despite the wide variety of exposures we encounter, only rarely are we able to look to rigorous scientific trials to guide us in managing our patients. What is the best therapeutic option for someone who injects mercury intravenously? What if the patient ingested diquat or presents with chronic lithium toxicity? Most of the problems encountered by the medical toxicologist are not ethical to study in a randomized controlled trial in humans and it is doubtful we will ever have definitive, evidence-based answers to many of our clinical questions. With so few trials to enlighten our practice, the evidence we often find ourselves turning to is the lowly case report.

Case reports suffer a bad reputation in the academic and evidence-driven world of modern medicine, but they can be extremely valuable, influencing both subsequent medical literature and clinical practice [1]. Especially in our field, in which there is a seemingly limitless possibility of things patients can be exposed to and numerous clinical questions that each exposure presents, case reports can provide toxicologists with at least some level of evidence to shape clinical expectations and guide management. The experience of another clinician presented with an unusual situation is at the very least interesting and thought-provoking, and at best alerts us to the presence of dangerous drug effects that had previously not been recognized. Ultimately, this may lead to prevention or prompt recognition and treatment of

those events [2]. More commonly, we take the information gained from single case reports, add it to what we already know, and do our best to use that information to improve our practice. The value of case reports for this purpose can be illustrated by examination of some of the American Academy of Clinical Toxicology practice guidelines for out-of-hospital management. When attempting to use scientific evidence to answer basic questions regarding toxic dose in order to determine who should be referred to the hospital following a beta blocker or ethylene glycol ingestion, the expert consensus panel was forced to rely heavily on case reports, which they considered level 4 evidence, due to the lack of studies available in the medical literature on even these very common poisonings [3–5].

Case reports deserve their rank far down the hierarchy of scientific evidence. They are essentially anecdotes, and there are countless published cases with absolutely no corroborating evidence to support the authors' claims. Perusal of case reports from the early 20th century can be extremely entertaining, not only because of the abundance of poisons used as treatments for the conditions being reported, but also because of the obvious confounders present in many of these reports. Unfortunately, case reports found in modern medical literature do not always rise above the level of entertaining anecdotes, diluting the value of the case report as a whole. Part of this may have to do with the lack of guidelines available to authors for preparation of case reports, in particular, guidelines addressing content [6].

The *Journal of Medical Toxicology* recognizes that a well-documented and well-presented case report can serve as a valuable tool for the medical toxicologist who may not have a higher level of evidence available on a particular topic. Two years ago, our Editor-In-Chief acknowledged the “essential value” of case reports to the toxicologist as well as the journal's intention to embrace the well-written case report [7]. Our challenge is to ensure a high standard and quality of cases published so that our readers will benefit professionally and enjoy their time spent reading the report. To achieve this goal, our next step is providing guidelines to authors for preparation of a well-documented case report.

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Guidelines for preparation of case reports have been published in other journals, but have not been standardized [8]. Tools have also been developed to evaluate adverse drug events and drug-drug interactions, but these are not easily incorporated into broad criteria that can be applied to all case reports relevant to medical toxicology [8,9]. The diverse nature of the educational point being made makes development of strict criteria for content difficult to apply across the board. Perhaps the most useful guidelines to consider when preparing a case report are those proposed by Sir Austin Bradford Hill for determination of causation [10]. Although his 9 “viewpoints” are generally applied to epidemiology research, several—including temporality, plausibility, and coherence—are equally relevant for determining whether association between a toxin and a physical finding or disease process is indicative of a cause-and-effect relationship. Others—including consistency, biological gradient, and analogy—may be applicable to a subset of toxicology case reports.

After consideration of the Hill criteria for causality in addition to examination of detailed guidelines for documentation of adverse drug events and detailed guidelines for development of case reports published in other journals [11,12], we developed a short set of guidelines to direct authors in preparing case reports for *JMT*.

The following Guidelines for Preparation of Case Reports have been developed by the editors of *JMT*. Adherence to these general guidelines should lead to construction of pertinent and informative reports.

GUIDELINES FOR PREPARATION OF CASE REPORTS FOR *JMT*

1. The title should reveal the unusual aspect of the case.
2. The case should describe a unique or rare clinical finding or toxicological disease process of interest and value to *JMT* readers. Cases describing unique pharmacokinetic data, analytical methods, diagnostic tests, or therapeutic modalities are also appropriate.
3. The introduction should provide a brief background on the topic and explain why the report is of value.
4. The case must be well documented and include all relevant clinical information. Most important, there should be laboratory confirmation of the agent ingested whenever possible, with an attempt to exclude other possible causes of the finding or disease process. Credible corroborative evidence should be presented in all cases. Reports relying solely on patient history or presence of pill bottles may be rejected by the editors prior to peer review. For fatalities, postmortem examination and forensic toxicology results are desirable.
5. The discussion should focus on the unique aspect of the case being presented. Plausibility should be addressed, with potential mechanisms for the clinical finding or drug effect provided. If the finding or condition is not consistent with what we already know about the toxicological agent involved, this should also be addressed in the discussion.
6. Include a concise review of other relevant medical literature or similar case reports in the discussion.
7. Address limitations of the report, including other possible causes of the finding or condition, if they exist.

As *JMT* continues to grow, our goal is to bring to our readers as many high quality, controlled trials as will fit between our covers, but by committing to a high standard for acceptance of case reports, we hope to always make room for the enjoyable and clinically relevant ones.

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