Reports of case-control studies: What editors want from authors and peer reviewers

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In this editorial we do not intend to dictate to authors how they should carry out case-control studies. However, we believe that they must report their study well enough that the peer reviewers and the readers have all the information necessary to replicate the study exactly. Only with that information can they evaluate the study critically and assess its generalizability.

Reports of case-control studies describe retrospective studies. The authors compare people who have a clinical problem (case subjects) with those who do not have that problem (control subjects). Their goal is to determine whether the two groups differ in the proportion of people exposed to one or more specific factors. At the start of a case-control study the case subjects have the clinical problem of interest.

Thus, the validity of a case-control study depends on the authors' ability to make a fair comparison between the two subject groups in order to assess the exposure factor(s). The key issue, then, in assessing reports of case-control studies is bias. Indeed, peer reviewers assume the study is biased unless the authors have proven that the study was carefully designed and conducted. Authors must show that they have considered the many potential biases associated with case-control studies and have taken appropriate steps to minimize them, and they must provide evidence, if possible, that these steps have been effective. With this concern for bias in mind, the following specific points should be considered in preparing or reviewing manuscripts that describe case-control studies.

The introduction

Four features should go into the introduction: a clear statement of the problem, an assessment of the importance of the problem, a summary of the current relevant literature and a statement of the research question.[1] In the report of a case-control study the authors also need to explain their selection of the case-control approach, with its inherent potential for bias, over other, more rigorous study designs.

The methods

The main consideration in the methods section of a case-control study report is how the authors have selected the case and control subjects. For example, the authors must define their eligibility criteria — that is, what constitutes a case subject — and how such subjects were identified. They should also consider how representative the selected case subjects are.

The selection of concurrent control subjects is perhaps the main source of potential bias. The authors must identify clearly what method they used and why they believe that method was appropriate to their study. In addition, the authors must provide enough information about the control subjects so that readers can determine whether the groups are comparable in all aspects except the presence of the condition under study and the exposure factor.

The authors should describe clearly how they assessed the exposure factor(s). This is usually quite

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difficult because of the retrospective nature of case-control studies.

As in all studies involving statistical analysis the authors must explain clearly what statistical methods were used. They must report the sample size calculated to ensure that the power of the study was great enough to identify clinically significant associations between the cases and the exposure factor(s).

The results

Reports of the results of case-control studies ideally contain several features. The authors should describe the results of their selection process (including nonresponders) and the general characteristics of each group. They should also describe the features of the exposure ascertainment, noting particularly any differences in the methods of assessing exposure within or between the two groups. The authors should report their estimates of the relative risk of the association between exposure and outcome by using odds ratios, including the 95% confidence intervals, while controlling for important potential confounding factors.

The discussion

In the discussion section the authors must identify and discuss the potential biases in the study and show how and by how much they might affect the results. Sackett[2] has described the biases that must be considered.

As with any study the authors should discuss their findings in consideration of discrepancies and similarities in the existing literature.

Finally, the importance of the study will boil down to what the authors can infer about causation from the observed association between the exposure factor(s) and the condition on the basis of their results and those of similar studies. But the authors must be very careful to remember that association does not prove causation. In interpreting their results the authors should remember that criteria for causation exist[3,4] and must be applied before statements of causation are made.

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