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SAPIENTIA ET ARTE CUSTODIMUS

EDITORIAL

The need for uniformity in research definitions and the Standardized Endpoints for Perioperative Medicine (StEP) initiative

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Medicine improves through the generation of hypotheses which are subsequently tested in clinical trials. These trials provide the foundations necessary for us to provide increasingly better care to our patients. Providing the best available medicine to our patients is summarised in the three principles of evidence-based medicine: i) appraisal of the totality of the medical evidence, ii) assessment of the quality of this evidence in order to make appropriate clinical management recommendations and iii) to understand and respect the patients' preferences regarding the risk-benefit of any proposed intervention.¹

In order to understand the totality of the current evidence, a systematic review and meta-analysis of clinical trials (or observational cohorts, if no trials exist) is often required. However, despite comprehensive literature searches and the presence of numerous study or trial publications, it is sometimes either impossible to generate a meaningful meta-analysis, or only a poor meta-analysis is possible, which compromises the reader's confidence in the findings. These scenarios are commonly due to inconsistent definitions of patient outcomes and differing time frames in reporting these outcomes. It is particularly distressing that something as simple as the outcome definitions adopted and the time at which these outcomes were reported can compromise a meta-analysis, especially when there are an adequate number of recruited patients in the meta-analysis to provide sufficient power to answer the clinical question.

Two recent publications illustrate this point in high risk patients undergoing major noncardiac surgery. This is an area of practice with a high morbidity, where we would hope to accumulate evidence for beneficial practice earlier rather than later. The first example is cardiopulmonary exercise testing. In the United Kingdom, cardiopulmonary exercise testing is commonly conducted for preoperative risk stratification. Indeed, it was estimated that approximately 15 000 preoperative cardiopulmonary exercise tests were conducted in 2011 in England.² However, despite the volume of patients undergoing preoperative cardiopulmonary exercise testing, a recent systematic review which included 37 studies of 6 775 patients found it impossible to conduct a meta-analysis.³ Furthermore, despite this high-risk surgical cohort, not all the studies reported mortality, and when mortality was reported it was reported at various time intervals; in-hospital, 30 or 90 days, 1 or 2 years, or worse still, not even reported. The definitions of morbidity were totally inconsistent. How is it that we have failed our patients so badly, that we cannot present data consistently in order to make meaningful clinical recommendations for a preoperative risk stratification tool, which is so commonly used for high risk noncardiac surgical patients?

The second example is the utility of haemodynamic goal-directed algorithms in decreasing patient morbidity following major noncardiac surgery. The largest trial to date, Optimisation of Cardiovascular Management to Improve Surgical Outcome (OPTIMISE) trial, was inconclusive.⁴ However, an updated meta-analysis that included this

trial found haemodynamic goal-directed therapy algorithms to improve surgical outcomes, with a risk ratio for postoperative complications of 0.77, 95% confidence interval 0.71-0.83.⁴ Superficially, this result suggests that we should adopt haemodynamic goal-directed therapy algorithms in clinical practice. Unfortunately, the authors state that due to the inconsistent reporting of outcomes "with diverse criteria for complications reported over a variety of time frames," our confidence in the result of the meta-analysis is compromised. Indeed, this is reflected in the heterogeneity of the point estimate (I^2 of 31%),⁴ despite the large (and adequate) number of recruited patients in the trials. Surely this is an injustice.

In order to ensure that in the future we can aggregate data confidently, and hopefully achieve earlier consistent and reliable clinical signals from meta-analyses, an initiative known as the Standardized Endpoints for Perioperative Medicine (StEP) has been established and is led by Paul Myles and Mike Grocott.⁵ The principle of this initiative is to generate standardized outcome definitions for clinical trials. Adopting standardised outcome definitions would allow us to easily aggregate study or trial data to generate meaningful meta-analyses. Consistent outcome reporting would increase the number of studies or trials that could be included in a meta-analysis, which in turn would increase the event rate, and thus decrease the heterogeneity of the point estimates,⁶ and therefore increase our confidence in the overall result or summary statistic of the meta-analysis. It is an injustice to patients who willingly participate in clinical studies or trials, if their data cannot contribute timeously to answering other clinically relevant questions, because the outcome definitions adopted by the investigators across studies or trials are inconsistent. The StEP initiative addresses this simple limitation in outcomes reporting. StEP will be launched at the 16th World Congress of Anaesthesiologists in Hong Kong later this year. It will be a session well worth attending.

Conflict of interest

Bruce Bliccard is on the Executive of the Standardized Endpoints for Perioperative Medicine (StEP) group

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