ICU
MANAGEMENT & PRACTICE

Effect Sizes in Ongoing Critical Care Trials

Estimates of prior probability are important to the proper interpretation of a randomised controlled trial's results. For some of the largest ongoing critical care trials, many clinicians regard prior probabilities as low and consider that plausible effects on absolute mortality for study treatments being investigated are less than 5%, according to a systematic review published in the journal Critical Care.

Mortality measured at a particular time point (landmark mortality) is often regarded as the gold standard outcome for randomised controlled trials in critical care medicine. However, the utility of trials in generating evidence for interventions to increase survival in intensive care unit (ICU) patients has been disputed.

An important limitation of many critical care trials is that they hypothesise large, and potentially implausible, reductions in mortality. This is a major problem in trial design for two reasons. First, it makes a type II error (false-negative) more likely. Second, the less plausible a postulated mortality reduction is, the more likely it is that a statistically significant mortality difference will represent a type I error (false-positive).

Interpretation of trial results could be improved by systematic assessment of the plausibility of trial hypotheses; however, such assessment has not been attempted in the field of critical care medicine. In this study, researchers sought to determine clinicians' views about prior probabilities and plausible effect sizes for ongoing critical care trials where the primary outcome is landmark mortality.

The research team conducted a systematic review of clinical trial registries in September 2015 to identify relevant clinical trials, followed by a clinician survey to obtain opinions about 10 large trials. Clinicians were asked to estimate the probability that each trial would demonstrate a mortality effect equal to or larger than that used in its sample size calculations.

Estimates provided by individual clinicians varied from 0% to 100% for most trials, with a median estimate of 15%. The median largest absolute mortality reduction considered plausible was 4.5%, compared with a median absolute mortality reduction used in sample size calculations of 5%.

The authors state, "our finding that effect sizes postulated by investigators often appear to be larger than the median effect sizes considered plausible by clinicians is consistent with previous literature suggesting that effect sizes used to inform sample size calculations are often inflated."

Also, they note that further work is needed to determine whether pooled estimates obtained by surveying clinicians are replicable and accurate or whether other methods of estimating prior probability are preferred.

Source: Critical Care
Image Credit: Pixabay

Published on : Tue, 13 Jun 2017