Clinical and conceptual approaches to interpreting the findings of systematic review and meta-analysis of mortality after drug-eluting stents vs. coronary artery bypass grafting for left main coronary artery disease

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This commentary refers to 'Mortality after drug-eluting stents vs. coronary artery bypass grafting for left main coronary artery disease: a meta-analysis of randomized controlled trials' by Y. Ahmad *et al.*, doi:10.1093/eurheartj/ehaa135.

A recent systematic review and meta-analysis study was published in the *European Heart Journal* by Ahmad *et al.*[1]

Innovative investigation: This study treads novel ground in delineating the comparative effectiveness of each mode of treatment, with focus on prognosis/mortality of the patient post-treatment. Nevertheless, there are some aspects of the meta-analysis that we would like to require addressing.

Publication bias: Ahmad *et al.* used PRISMA guidelines for conducting of the analysis, which requires that meta-analysis studies also conduct publication bias assessment.[2] Therefore, we would like to recommend publication bias analysis using Egger's bias indicator test.[3]

Variance of true effect size: We recommend the use of the Tau^2 parameter, in addition to the I^2 parameter for the assessment of between study heterogeneity, in order to present a more robust analysis (*Table 1*).

Pooled effect size: In addition, we observe that the study conducted used relative risk as the effect size metric for meta-analysis. However, while combining randomized controlled trials in a meta-analysis, the standard mean difference may be a more appropriate effect size metric to represent the pooled data.[4]

Table 1 Heterogeneity and hypothesis testing of the included studies

Subgroups	Heterogeneity			HR	95% CI		HR	95% CI		Fixed effects model			Random effects model		
	Q	P	I^2		Low	High		Low	High	Z	P	Studies	Z	P	Studies
Risk of death	7.12	0.13	43.89	1.08	0.90	1.30	1.03	0.78	1.35	0.87	0.38	5	0.22	0.83	5
Risk of cardiac death	3.80	0.28	21.07	1.03	0.78	1.35	1.01	0.74	1.39	0.22	0.83	4	0.10	0.92	4
Risk of stroke	9.2	0.06	56.51	0.75	0.52	1.08	0.73	0.36	1.47	-1.53	0.13	5	-0.87	0.37	5
Risk of MI	1.45	0.69	0	1.24	0.95	1.62	1.25	0.95	1.63	1.61	0.10	4	1.61	0.11	4
Risk of revascularization	0.72	0.95	0	1.88	1.58	2.25	1.89	1.58	2.25	7.09	0	5	7.09	0	5

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Sample size: The lack of sufficient number of studies is also an issue, as the meta-analysis conducted here only uses a total of five studies, which is not sufficient to provide a result of sufficient power to be used in clinical decision-making. A limitation that requires highlighting.

Survival endpoints: We would also like the authors to describe their reasoning behind comparison of studies with different endpoints, as the studies are split between a 5-year follow-up, and a 1-year follow-up, and comparing studies with variable endpoints may introduce heterogeneity into the study.[1]

Statistical significance or estimated effect size: It is also recommended that the results of the study be described purely in terms of the effect size metric in the meta-analysis, and not using 'statistical significance', as it has shown to be limited in describing statistical results.[5]

It also worth noting that as this study is a literature based meta-analysis, the results may guide clinical decision making, but it cannot present any recommendations for treatment.

References

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