

CABG vs. PCI in the treatment of coronary artery disease

Read

Hlatky, M. A., et al. (2009). Coronary artery bypass surgery compared with percutaneous coronary interventions for multivessel disease: a collaborative analysis of individual patient data from ten randomised trials. *Lancet*, 373(9670), 1190-1197.

Article link: <http://www.sjsu.edu/faculty/gerstman/misc/Hlatky2009.pdf>

Reading and studying this article will take several hours. If and when you encounter terms you do not understand, take the time to look them up using reliable biomedical and web sources. Clearly identify the study “exposure” (type of treatment), “outcome” (all-cause mortality), and important cofactors (e.g., age, diabetes). Identify key counts, frequencies, rates, and statistics.

Comment: The results of this meta-analysis may not fully apply to newer forms of treatment such as percutaneous interventions using drug-eluting stents.

Questions

1. Page 1 (column 2, paragraph 1) of the published article states “observational studies [on CABG vs. PCI interventions for multivessel heart disease] have been confounded by treatment selection bias.” Let us assume that this treatment selection bias would be more likely to “channel” the more serious coronary artery disease cases to CABG treatment than to PCI treatment. Clarify how the three properties of confounding variables apply to this situation. Show how the relation between exposure (treatment type) and outcome (mortality) could be confounded by the potential confounder of the underlying severity of coronary artery disease in this study.
2. Would the treatment selection bias described in question #1 be likely to bias the results of the meta-analysis in favor of CABG or PCI *if* this meta-analysis been based on observational data? How did restricting the meta-analysis to randomized studies avert this problem?
3. Use the data on page 2, column 2, ¶6 of the published article to calculate the crude RR of death comparing CABG to PCI. Show your work. (Optional: Determine a 95% CI for the RR.)
4. Hazard ratios (HRs) may be interpreted as relative risks (RRs). Several of the HRs in the article were slightly less than 1. For example, the overall HR comparing CABG to PCI was 0.91 (95% CI 0.82–1.02; $p=0.12$). Do you agree with the author’s conclusion that “long term mortality is similar after CABG and PCI in most patients”?
5. Use the results shown in Figure 2 (page 4) of the article to discuss the relative benefits of CABG vs. PCI, if any, within specific age groups.
6. Use Figure 2 (page 4) in the published article to discuss the relative benefits of CABG vs. PCI, if any, within diabetics and non-diabetics.

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