COMPARATIVE EFFECTIVENESS REVIEW: DRUG-ELUTING STENTS VERSUS BARE-METAL STENTS FOR ACUTE myocardial infarction

OBJECTIVES: To estimate the relative impact of drug-eluting stents (DES) versus bare-metal stents (BMS) on death, myocardial infarction (MI), target vessel revascularization (TVR), and stent thrombosis (ST) in patients with ST-elevation acute myocardial infarction (STEMI) by performing comprehensive meta-analyses of randomized controlled trials (RCTs) and observational studies.

METHODS: We searched Ovid-Medline, Embase, the Cochrane Library, and conference proceedings for articles comparing outcomes between DES and BMS among STEMI patients presented through September 2009. The quality of studies was evaluated by using the Cochrane’s risk of bias for RCTs and the MINORS (Methodological Index for Non-Randomized Studies) for observational studies. The relative risk (RR) using the inverse variance random-effects method for each study outcome was calculated. RCT and observational data were analyzed separately. To assess heterogeneity of RRs across trials, we used the Cochran’s Q-statistic and I-squared statistic. Subgroup analyses were performed by length of follow-up and meta-regression to test if the predictors of outcomes by stent type, funnel plots, the Egger test, and the Begg test were used to assess publication bias. To assess the quality of the evidence, we used GRADEpro.

RESULTS: Fifteen RCTs were identified (N = 7,654; kappa statistic = 0.90). Compared with BMS, DES significantly reduced TVR (RR: 0.48; 95% confidence interval [CI]: 0.41–0.56) and mortality (RR: 0.76; 95% CI: 0.60–0.96), without increasing death (RR = 0.88; 95% CI: 0.70–1.11) and ST (RR: 0.93; 95% CI: 0.72–1.21). Among 35 observational studies (N = 44,849), DES significantly reduced death (RR: 0.85; 95% CI: 0.79–0.91) and TVR (RR: 0.61; 95% CI: 0.48–0.77). MI and ST were significantly lower in the DES group with no differences in follow-up, with no evidence of publication bias. There was no evidence of statistical heterogeneity and publication bias. Among RCTs, the quality of the evidence of TVR was assessed as “high”, death and MI as “moderate”, and ST as “low”. The quality of the evidence from observational studies was assessed as “very low” or “low”.

CONCLUSIONS: These data in aggregate suggest that using DES in STEMI patients are safe and efficacious but there are differences between RCT and observational data comparing DES and BMS.