Long-term efficacy and safety of newer generation ultrathin strut drug-eluting stents: a systematic review and meta-analysis

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Background: Recent trials have demonstrated that short-term efficacy and safety of ultrathin strut drug-eluting stents (DES) were non-inferior to contemporary stents but long-term benefit remains uncertain.

Purpose: The main objective of this meta-analysis was to evaluate efficacy and safety of ultrathin strut DES with an extended follow-up in comparison to 2nd and 3rd generations DES.

Methods: A double-blind review of randomized controlled trials (RCT) comparing ultrathin strut DES to contemporary DES was performed from MEDLINE and CENTRAL databases and from cardiological congresses. The primary efficacy endpoint was target vessel failure (TLF) defined as a composite of cardiac death, target vessel myocardial infarction (TV-MI) and target lesion revascularization (TLR) and the primary safety endpoint was occurrence of stent thrombosis (ST). Short (1 year) and long term (≥2 years) effects were estimated separately. This analysis was pre-specified in PROSPERO (CRD42019142206).

Results: The meta-analysis included 13 RCT including 19,490 patients. In short term, we found TLF decrease with ultrathin strut DES (RR 0.85, CI [0.75–0.97], p=0.01), driven by lower TV-MI (RR 0.83, CI [0.66–1.03], p=0.1) and TLR (RR 0.77, CI [0.58–1.01], p=0.1) rates, and a non-significant downward trend in ST (RR 0.85 CI [0.64–1.14]).

In long term, from the 5 trials with extended follow-up, there was no significant difference between ultrathin strut DES and thicker strut stents in rate of TLF at the longest available follow-up (RR 0.90, CI [0.76–1.06], p=0.2), despite a numerically reduction of TV-MI (RR 0.81, CI [0.61–1.08], p=0.05) and TLR (RR 0.85, CI [0.69–1.04], p=0.1) in favor of ultrathin strut stents. However, we observed a persistent numerically reduction in ST (RR 0.79, CI [0.61–1.02], p=0.01).

Conclusion: Ultrathin strut DES was associated with a lower target lesion failure rate at one year but not beyond 2-years follow-up. Nevertheless, the safety of the ultrathin strut stents was sustained over time with a numerically reduction of ST.