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Drug-eluting stents: meta-analysis in diabetic patients

Andre J. Scheen, Fabian Warzée, Victor M.G. Legrand

Division of Diabetes Nutrition and Metabolic Disorders and the Division of Cardiology Department of Medicine CHU Sart Titman (B35) B-4000 Liège, Belgium

Dear Editor,

We read with interest the systematic review on drug-eluting stents (DES) by Hill et al.[1] The early data available indicate that DES reduce in-stent restenosis and major adverse cardiac events (MACE), mainly revascularizations. Although diabetes mellitus represents a major risk factor for coronary heart disease, no specific attention has been devoted to this particular population in this remarkable review. In the ARTS study, diabetic patients undergoing coronary stenting had a poorer prognosis than non-diabetic patients and diabetic patients treated with bypass surgery.[2] A recent meta-analysis of six trials in patients receiving coronary angioplasty with bare-metal stents (BMS) reported that the odds ratio (OR) of restenosis associated with diabetes was 1.61 (95% CI 1.21-2.14, $p = 0.004$).[3] As DES significantly reduce restenosis rates,[4] especially in small vessels, it would be interesting to specifically analyse the potential impact of DES in diabetic patients. We performed a meta-analysis of the results from six recent trials comparing DES and BMS, using sirolimus (RAVEL, SIRIUS and E-SIRIUS) or paclitaxel (TAXUS II, TAXUS IV and TAXUS VI). These trials provided adequate figures which allowed us to recalculate the rate of in-stent restenosis (defined as a stenosis ≥ 50%) after a follow-up of 6-12 months in both diabetic (around 20% of the population) and non-diabetic patients (Fig. 1). OR of restenosis was markedly lower when comparing DES with BMS and similar in both non-diabetic (OR: 0.16; 0.12-0.20; p <0.00001) and diabetic (OR: 0.16; 0.11-0.24; p <0.00001) patients. However, as compared to non-diabetic individuals, the OR of in-stent restenosis associated with diabetes still averaged 1.96 (1.28-3.01) in the groups receiving DES (p = 0.002), a figure quite similar (although less consistent between studies) to that observed with BMS (OR = 1.90; 1.49-2.43; p <0.00001). Interestingly, in the SIRIUS substudy specifically devoted to diabetes,[5] in-lesion restenosis was significantly reduced with DES compared to BMS in the non-insulin-requiring patients (7.7% vs. 49.3%, $p < 0.001$), but not in the insulin-requiring patients (35% vs. 50%, p = 0.38). MACE incidence after 9 months was reduced from 25% with BMS to 9.2% with DES ($p < 0.001$) in diabetic patients and from 16.5% to 6.5% ($p < 0.001$) in non-diabetic patients, respectively. Finally, in the RESEARCH registry of DES use in the real world,[6] diabetes was a significant predictor of MACE (OR =1.62; 1.09-2.43; $p = 0.02$), especially clinically driven target vessel revascularization (OR =1.81; 1.10-2.99; $p = 0.02$).

In conclusion, DES are associated with a 80% remarkable relative risk reduction of restenosis during the first year of follow-up in diabetic patients as compared to BMS, similar to that observed in non-diabetic subjects. However, despite the use of DES, diabetes mellitus still remains an independent risk factor of restenosis, need for revascularization and MACE. Further specific prospective studies with highly effective DES should be performed in this high risk diabetic population.

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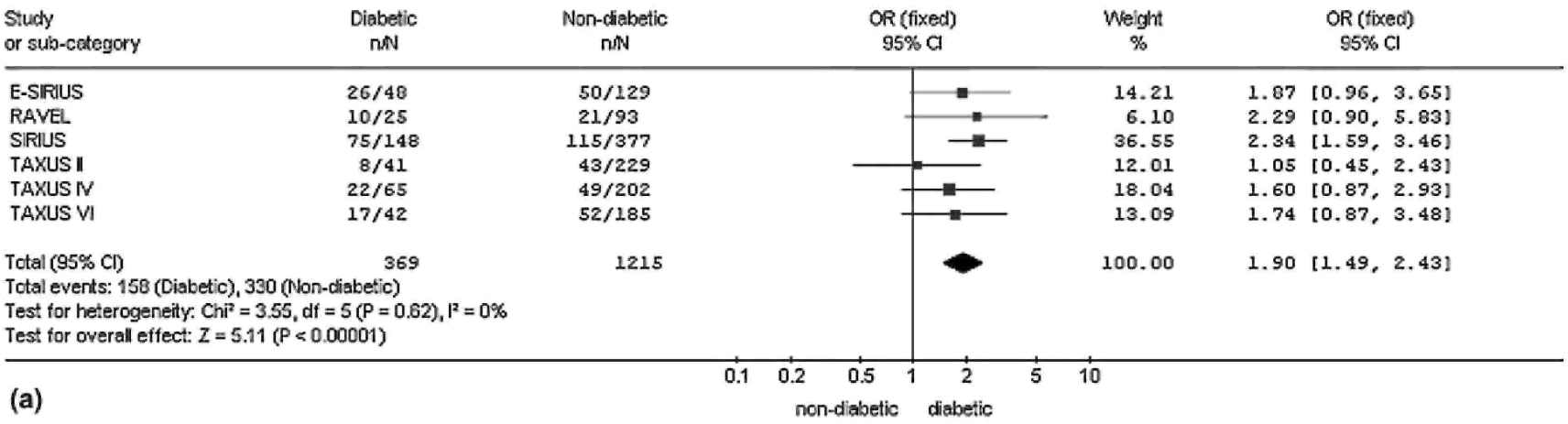
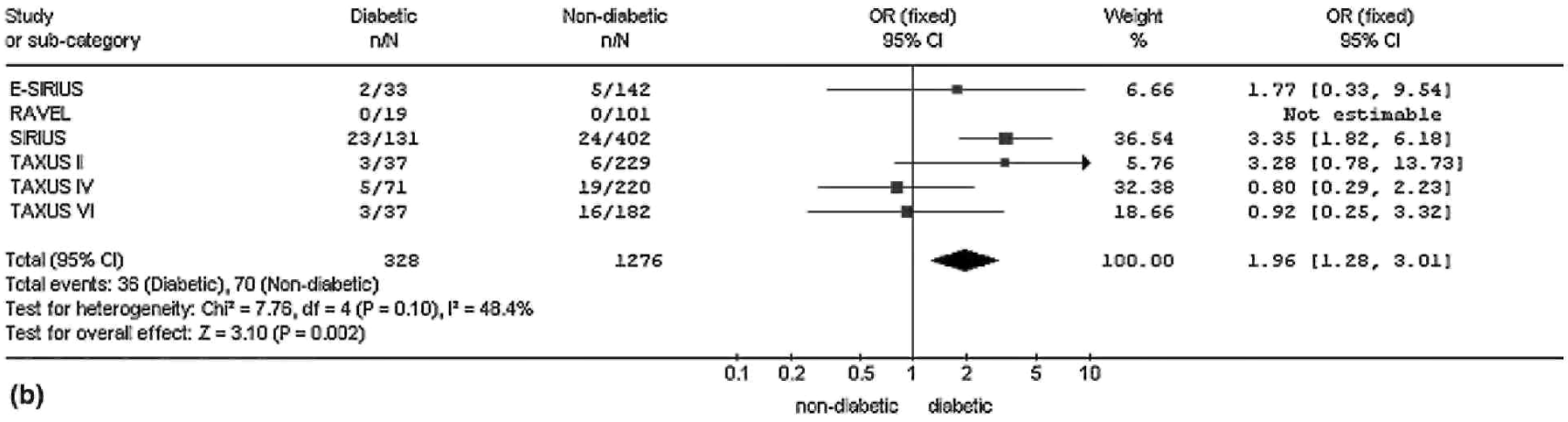
Fig. 1: *Meta-analysis of six trials comparing the effects of bare-metal stents (BMS) (a) vs. drug-eluting stents (DES) (b) on restenosis in diabetic (d) vs. non-diabetic patients. (c) OR: odds ratio.*





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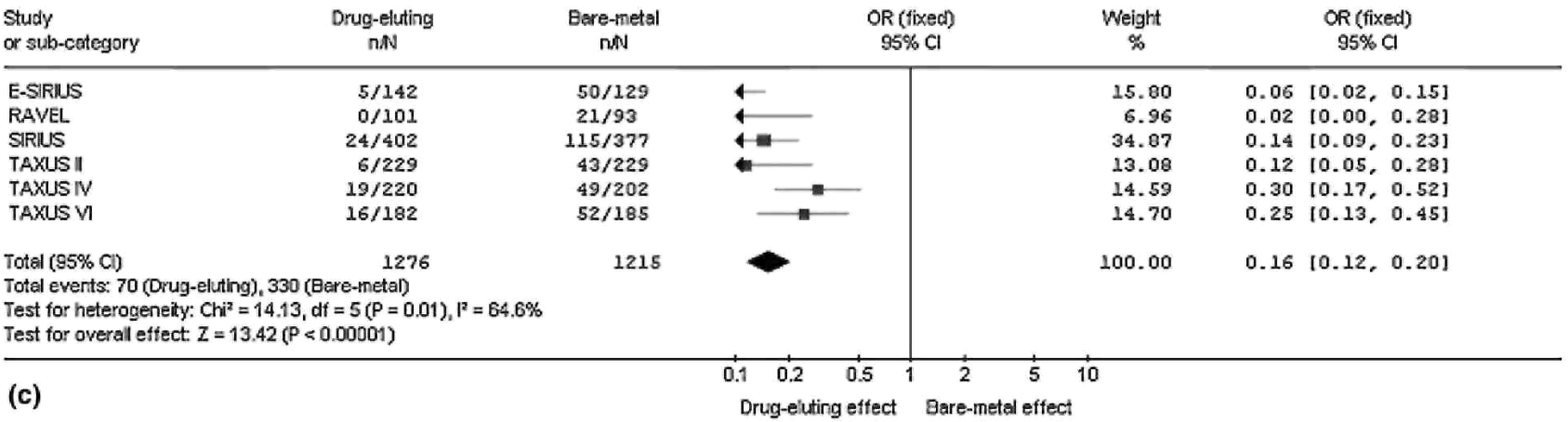

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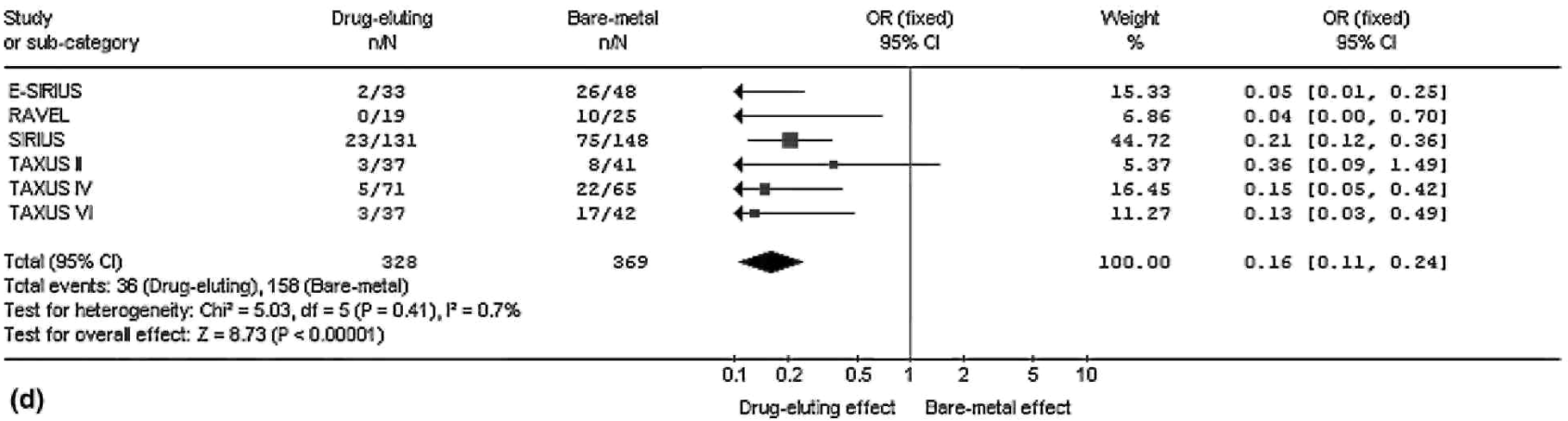

(d)

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