



Cardiovascular Outcomes of Dapagliflozin (Sodium-Glucose Co-transporter-2): A Systematic Review and Meta-Analysis

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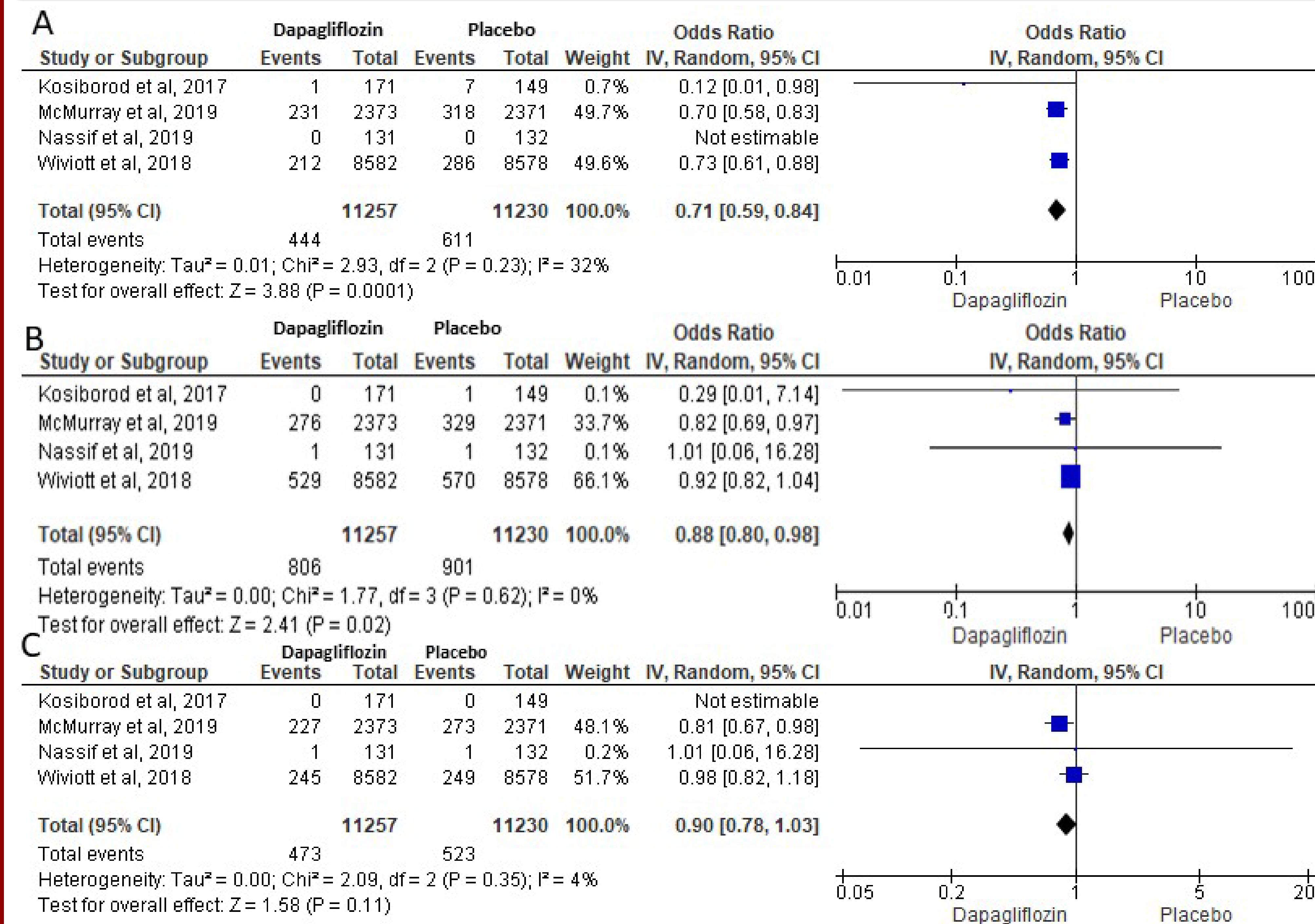
Background

Dapagliflozin (SGLT-2 inhibitor) has shown to reduce mortality and hospitalization for heart failure patients with and without diabetes mellitus, through mechanisms independent of glucose transport. We seek to assess the recent published evidence on use of SGLT-2 inhibitor and cardiovascular outcomes by conducting a meta-analysis.

Methods

- Extensive search was performed by two independent researchers on PubMed and Ovid using key words Dapagliflozin, heart failure and cardiovascular outcomes yielding 739 studies.
- Review articles, abstracts and unrelated studies were excluded. 20 full length articles were assessed leading to final selection of 4 randomized controlled studies comparing outcomes of Dapagliflozin with placebo.
- We compared clinical outcomes including hospitalization for heart failure, all-cause mortality and cardiovascular mortality between Dapagliflozin and placebo.
- Study-level analysis was done with Review manager. The results are reported as OR, 95% confidence interval and P <0.005.

Forest plot



Panel A: Hospitalization from heart failure. Panel B: All cause mortality. Panel C: Cardiovascular mortality

Baseline Demographics

Study	Groups	Sample (n)	Male %	Age Mean	DM %	CHF %	LVEF, Mean	BMI, Mean	HF Hospitalization %	AF %	CAD %	ICD/CRT %
Kosiborod et al.	Dapagliflozin	171	64.3	63.6	100	100	-	34.1	-	9.9	86	-
	Placebo	149	61.1	64.9	100	100	-	34.3	-	12	81.2	-
McMurray et al.	Dapagliflozin	2373	76.2	66.2	41.8	100	31.2	28.2	47.4	38.6	55.5	26.2/8.0
	Placebo	2371	77	66.5	41.8	100	30.9	28.1	47.5	38.0	57.3	26.1/6.9
Nassif et al.	Dapagliflozin	131	72.5	62.2	61.8	100	27.2	30.7	77.1	43.5	53.4	67.2/32.8
	Placebo	132	74.2	60.4	64.4	100	25.7	30.6	81.8	37.1	52.3	56.8/18.9
Wiviott et al.	Dapagliflozin	8582	63.1	63.9	100	9.9	-	32.1	-	-	32.9	-
	Placebo	8578	62.1	64.0	100	10.2	-	32.0	-	-	33.0	-
Total	Dapagliflozin	11257							87.2	31.3		9.99
	Placebo	11230							87.3	31.4		10.99

Results

- 22,487 patients included in 4 trials
- Dapagliflozin : 11,257 patients
- Placebo: 11,230 patients
- Hospitalizations for heart failure:
- OR: 0.71; 95% CI: 0.59-0.84; p= 0.0001
- All-cause mortality: OR: 0.88; CI: 0.80-0.98; p= 0.02
- Cardiovascular mortality: OR: 0.90; CI: 0.78-1.03; p= 0.11
- Heterogeneity assessment reported I² < 30% in cardiovascular mortality and all-cause mortality.

Conclusion

- Dapagliflozin is associated with significant decrease in hospitalization due to heart failure and all-cause mortality with positive trend towards improvement in cardiovascular mortality.
- Benefits of Dapagliflozin on clinical improvement in heart failure appear to extend to patients without type 2 diabetes mellitus.
- Dapagliflozin should be identified as a potential add-on therapy to improve clinical outcomes in suitable patients.

References

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- DAPA-HF Trial. Mikhail N. Kosiborod. Circulation. 2020