The effect of the sodium-glucose co-transporter Dapagliflozin upon cardiovascular risk factors and risk scores in a Scottish teaching hospital

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Therapeutics in Type 2 Diabetes Mellitus is an ever-expanding and increasingly complex area of interest. Sodium -glucose co-transporter (SGLT2) therapies are a fairly new treatment modality and are recognised to have benefits other than improved glycaemic control. They confer the advantage of both weight loss and blood pressure reduction, with potential to improve macrovascular risk as a result. This has recently been demonstrated in the exciting EMPA-REG OUTCOME trial where treatment with Empaglaflozin reduced the primary outcome by 14%.[1]

We sought to ascertain the relative benefits of one of the SGLT2s, Dapagliflozin, on cardiovascular risk profile, in a planned, observational analysis of routine care in a university hospital.

METHODS

This study analysed the effect of Dapagliflozin upon weight, BP and HbA1c over an 18 month period in patients with T2DM. We also measured lipid profiles and using the UKPDS risk calculator were able to assess 10-year risk scores for coronary heart disease (CHD) before and after treatment. The data was analysed using SPSS statistics software. A t-test was used to determine statistical significance and a model was utilised correcting for age, sex, duration of diabetes, heart rhythm and smoking status to assess the effect on cardiovascular risk scores.

RESULTS

A total of 94 patients on Dapagliflozin were assessed from our clinic population, of which 40 were male. The demographics are listed in Table 1.

Table 1: Baseline characteristic s of patients on Dapagliflozin.

Category	Mean	St Dev
Age (years)	56.89	8.81
BMI (kg/m^2)	36.09	7.39
Weight (kg)	101.01	23.78
Duration of DM (years)	11.82	5.05
Systolic BP (mmHg)	135.84	16.04
Diastolic BP (mmHg)	79.77	10.68
HbA1c (mmol/mol)	83.15 (9.8%)	16.78
Total Cholesterol (mmol)	4.12	0.91

44 were non-smokers, 40 were ex-smokers and 10 current smokers. Concomitant insulin therapy was prescribed in 39 individuals.

Table 2: Effect of Dapagliflozin on cardiovascular parameters

	Pre Dapagliflozin	Post Dapagliflozin	P value
HbA1c (mmol/mol)	83.15 ± 16.78	69.23 ± 14.03	<0.001
SBP (mmHg)	135.84 ± 16.04	121.54 ± 13.48	0.004
DBP (mmHg)	79.77 ± 10.68	75.3 ± 7.63	0.06
Weight (kg)	101.00 ± 23.78	96.58 ± 22.32	0.003

The mean UKPDS 10-year risk for Coronary Heart Disease demonstrated significant reduction after 18-months Dapagliflozin treatment, from 20.28% to 17.39% (p <0.001).

CONCLUSION

We have demonstrated, that similar to previous trial data,[2] Dapagliflozin treatment is associated with a reduced HbA1c, weight loss and reduced blood pressure. As a result, this was associated with a reduction in cardiovascular risk score. This effect requires validation within a randomised control trial with Dapagliflozin, and will help determine whether an improvement in cardiovascular outcome is a class effect for this group of medication rather than specific to an individual drug.

REFERENCES

1. Zinman B et al. Empaglifozin, Cardiovascular Outcomes and Mortality in Type 2 Diabetes. September 27, 2015 DOI: 10.1056/NEJMoa1504720

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