

1104-P

Many Benefits of Empagliflozin Persist in Those with Reduced Renal Function: Updated Data from the Association of British Clinical Diabetologists (ABCD) Audit Programme

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Disclosures

- TSJC has received an educational grant from Novo Nordisk

The ABCD audit programme...

- Launched in **March 2017**
- Aims:
 - To collect anonymised routine clinical data for patients taking Empagliflozin in order to provide real-world data on it's use
- Data input:
 - Primary care – via the online audit tool
 - Primary care – via data submitted by clinical commissioning groups
 - Secondary care – via the online audit tool

What we know so far...

- Mechanistically sodium-glucose linked transporter 2 inhibitors (SGLT2s) require relatively intact renal function in order to exert an effect
- Data are limited on which beneficial effects, if any, may persist in those with reduced renal function at baseline

- Currently, SGLT2 inhibitors are not licensed for use at lower eGFRs
- For empagliflozin¹:
 - Do not commence – eGFR < 60mL/min/1.73m²
 - Discontinue – eGFR < 45mL/min/1.73m²

- **However, in the UK**, many medications are used outside of license – opportunity to examine the effects of SGLT2s in the real-world if they are being used in those with reduced eGFRs

Methods

- Data were extracted from the ABCD audit tool
- Those with baseline eGFR values were included in the analysis
- A minimum of a baseline and follow-up value was required for a dataset to be included in the analysis for each outcome variable

- Those included (n=5880) were stratified into groups as follows (eGFR in mL/min/1.73m²):
 - CKD1 (n=2900, eGFR≥90)
 - CKD2 (n=2753, eGFR<90, eGFR≥60)
 - CKD3a (n=211, eGFR<60, eGFR≥45)
 - CKD3b+ (n=16, eGFR<45)

- Analysis conducted in Stata 16 using paired t-test and ANOVA

Baseline characteristics

Characteristic		Total n=730	eGFR \geq 90	eGFR<90, \geq 60	eGFR<60, \geq 45	eGFR<45
Age, years \pm SD		59.5 \pm 10.4	55.4 \pm 9.5	63.2 \pm 9.6	68.3 \pm 8.2	69.6 \pm 8.5
Male, %		60.9%	59%	60.9%	63%	63.1%
Median diabetes duration, year (IQR)		7.3 (2.2-12.1)	1.4 (0.6-2.9)	7.4 (6.3-8.7)	12.2 (10.9-13.6)	16.8 (15.7-18.1)
Mean Hba1C, % \pm SD		9.18 \pm 1.61	9.31 \pm 1.69	9.05 \pm 1.52	9.02 \pm 1.65	9.08 \pm 1.60
	mmol/mol \pm SD	76.8 \pm 17.6	78.2 \pm 18.4	75.4 \pm 16.6	75.1 \pm 18.0	75.7 \pm 17.4
Mean BMI, kg/m ² \pm SD		33.1 \pm 6.5	33.3 \pm 7.0	32.8 \pm 6.7	33.0 \pm 6.5	34.6 \pm 4.3
Mean weight, kg \pm SD		98 \pm 20.9	95.9 \pm 20.8	96.9 \pm 19.8	98.2 \pm 21.6	92.6 \pm 19.6
Median ALT, U/L (IQR)		29 (21-41)	31 (22-45)	31 (22-43)	27 (20-37)	27 (20-38)
Mean eGFR, ml/min		81.8 \pm 11.4	90.3 \pm 2.8	75.1 \pm 9.0	54.4 \pm 3.8	39.2 \pm 4.5
Mean Systolic BP, mmHg \pm SD		132.1 \pm 13.9	131.8 \pm 13.7	132.5 \pm 13.9	133.6 \pm 15.4	121.1 \pm 19.1
Mean Diastolic BP, mmHg \pm SD		77.6 \pm 9.3	78.6 \pm 9.2	76.9 \pm 9.3	75.3 \pm 9.0	65.7 \pm 9.3

ALT, alanine aminotransferase; BMI, body mass index; BP, blood pressure

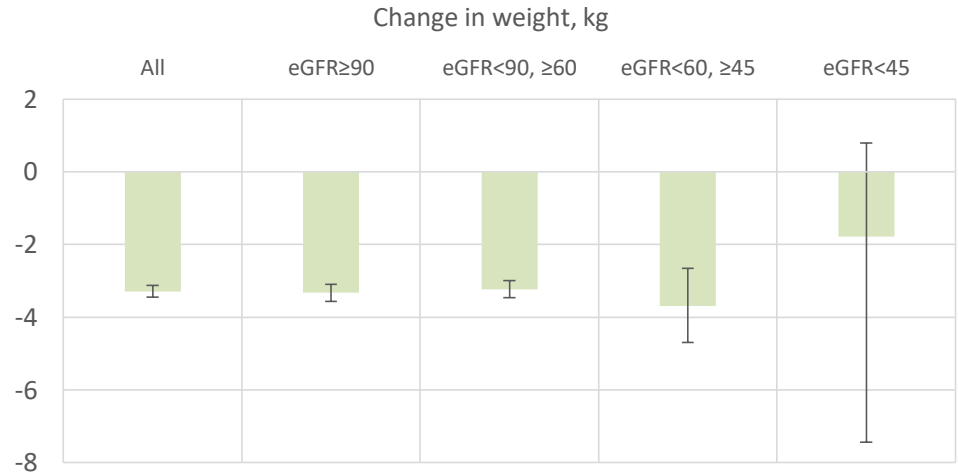
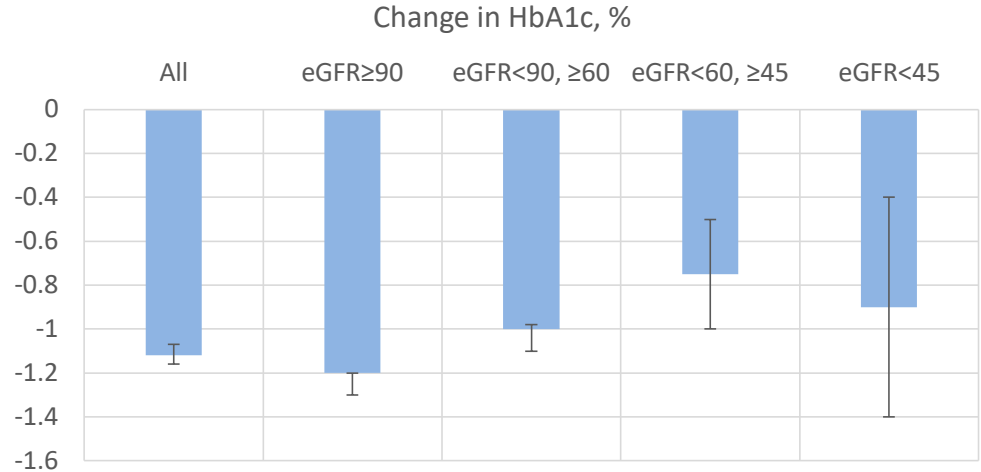
eGFR, estimated glomerular filtration rate

IQR, interquartile range; SD, standard deviation

Figures 1

- Significant reductions in HbA1c and weight occurred in all groups, although statistically significant difference between groups were noted (ANOVA $P < 0.001$)
 - HbA1c reductions appear to be of a lesser magnitude in those with reduced renal function at baseline

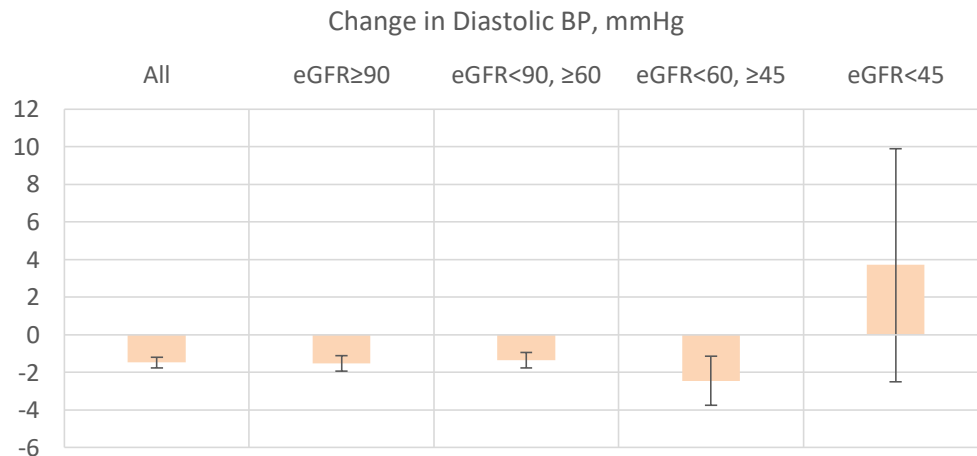
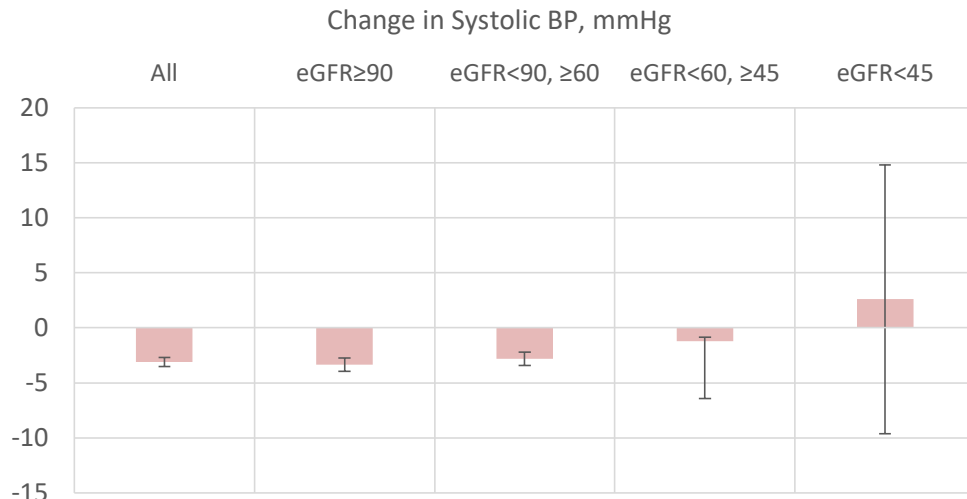
All results in figures significant to $P < 0.05$, except for weight in eGFR < 45 group. Error bars showing 95% CI



Figures 2

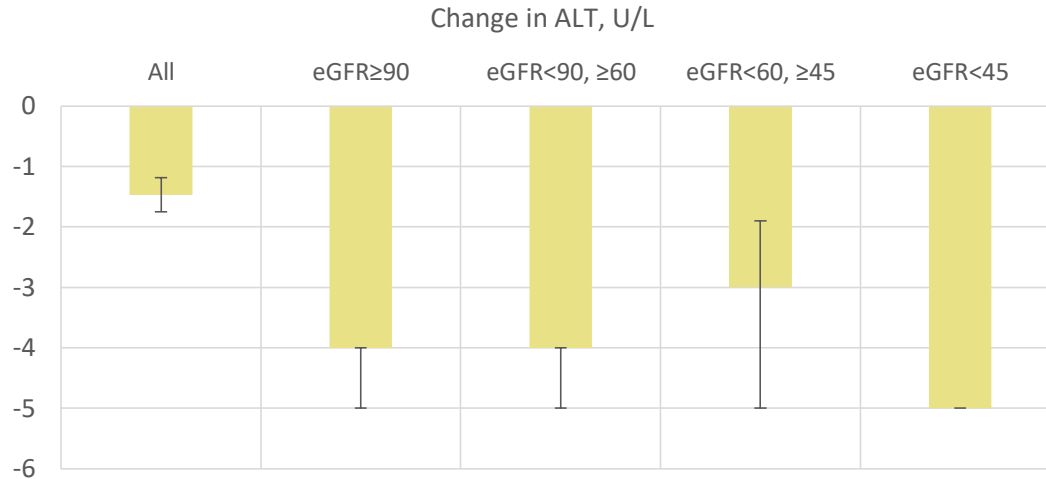
- Significant reductions in blood pressure, both systolic and diastolic, were noted in all groups with $eGFR \geq 45$, but not in those with $eGFR < 45$
 - Fit with proposed mechanism of BP lowering action
 - Lower eGFR, reduced renal glucose excretions and reduced osmotic diuresis

All results in figures significant to $P < 0.05$, apart from $eGFR < 45$ (not significant for either Systolic or Diastolic BP). Error bars showing 95% CI



Figures 3

- Improvements in some other parameters appears to be consistent across all levels of CKD
 - Comparable reductions in ALT across all groups
 - Failing to reach significance in eGFR<45 group - ?due to lower numbers



All results significant to $P < 0.05$, analysed by Wilcoxon Signed-Rank Test due to skewness. Error bars showing 95% CI

Discussion

- The use of empagliflozin at eGFR<45mL/min/1.73m² still confers statistically significant HbA1c improvements (although of lower magnitude) and weight loss
- Systolic BP and Diastolic BP reductions may be limited and fail to reach statistical significance in those with impaired renal function at baseline
- Long-term clinical outcomes were not assessed as part of this audit
- Limitations: some confounding variables unable to be adjusted for
- More evidence is needed regarding its use at lower levels of eGFR

Thank you for taking the time to read this presentation

References

1. EMPAGLIFLOZIN, British National Formulary Online (Accessed 24/05/2020)