Association of British Clinical Diabetologists

Sandwell and West Birmingham Hospitals NHS
NHS Trust

Early impact of liraglutide in routine clinical use (ABCD nationwide liraglutide audit) on cardiovascular risk (UKPDS risk engine)

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Background and aims

Liraglutide has been shown to reduce cardiovascular outcomes in patients at high cardiovascular disease (CVD) risk (LEADER study). Uncertainty exists regarding the impact of liraglutide on CVD risk in routine clinical care. The United Kingdom Prospective Diabetes Study (UKPDS) CVD risk engine version 2.0 uses recognised risk factors to calculate future CVD risk. Our aim was to investigate the impact of liraglutide in routine use on 10 year CVD risk.

Materials and methods

We used data from the Association of British Clinical Diabetologists (ABCD) Nationwide liraglutide audit which assesses liraglutide in routine clinical practice (6959 patients, 163 centres, 2009–2017). For this analysis we included all patients with all the factors utilised by the risk engine (age, duration of diabetes, ethnicity, systolic blood pressure, HbA_{1c}, total cholesterol and HDL cholesterol) measured before and at the earliest return to clinic between 3 and 9 months after commencing liraglutide. As we did not have data on atrial fibrillation or smoking these were assumed to be absent for the purposes of the analysis.

Results

The table shows baseline characteristics of the 747 patients and the early impact of liraglutide treatment on CVD risk factors. There were highly significant falls in all parameters involved in CVD risk assessment other than HDL cholesterol which was unchanged. The UKPDS risk engine mean ± SD 10-year coronary heart disease (CHD) risk fell by 2.7±7.6% from 18.7±13.0% to 16.1±11.6% (p<0.001). 10-year fatal CHD risk fell by 2.3±6.5% from 13.7±11.1% to 11.4±9.8% (p<0.001). 10-year stroke risk fell by 0.3±2.8% from 7.9±8.7% to 7.6±8.3% (p=0.003). 10-year fatal stroke risk fell by 0.1±0.7% from 1.2±1.4% to 1.1±1.3% (p=0.001). Weight, which is not a factor utilised in the UKPDS risk engine was assessed in the 3535 patients in the audit with weight and BMI data during the same time interval. Weight fell by 2.8±6.1 kg from 110.0±22.3 to 107.9±22.1 kg (p<0.001), and BMI by 0.98±2.2 kg/m^2 from 38.7±7.0 to 37.8±6.9 kg/m^2 (p<0.001).

Table: Baseline characteristics of the 747 patients who returned to clinic between 3 and 9 months after starting liraglutide and the change in cardiovascular risk parameters at the return visit as mean±SD or median (interquartile range [IQR]). Weight and BMI measurements in 3535 patients during the same time interval. *p*-values reflect change from baseline.

Parameter	Baseline	At 3–9 months	Difference	*P*-value
Age (years)	56.6±10.3			
Sex (% male)	56.2			
Ethnicity % White % Afro-Caribbean % Asian-Indian	 89.2 2.9 7.9			
Diabetes duration (Median (IQR) years)	9.0 (6.0–13.0)			
HbA_{1c} (mmol/mol)	77.2±18.0	67.4±18.6	–9.8±17.9	<0.001
HbA_{1c} (%)	9.2±1.6	8.3±1.7	–0.9±1.6	<0.001
Systolic blood pressure (mm Hg)	136.8±16.6	133.3±17.3	–3.5±17.7	<0.001
Serum total cholesterol (mmol/L)	4.22±1.57	3.97±1.01	0.25±1.45	<0.001
Serum HDL cholesterol (mmol/L)	1.10±0.32	1.12±0.79	–0.02±0.78	0.39
Weight (kg) (n=3535)	110.0±22.3	107.9±22.1	–2.8±6.1	<0.001
BMI (kg/m^2) (n=3535)	38.7±7.0	37.8±6.9	–0.98±2.2	<0.001

Conclusion

Starting liraglutide reduced 10-year CVD risk. These data suggest that liraglutide used in routine clinical care in 100 patients could prevent three events of CHD or stroke and save two or more lives over the next 10 years. As this represented the earliest assessment after commencement of liraglutide it is possible that the impact would be greater with longer follow up. The results are likely to be an underestimate as the UKPDS risk engine does not take into account BMI which is also reduced by liraglutide. A limitation of the study is that since the UKPDS risk engine was created there have been changes in such things as diets, smoking, exercise, use of statins, use and types of anti-hypertensives, treatments for diabetes, pollution levels, and alcohol consumption which might affect the validity of the tool when applied to recently collected data.

Reference: The UKPDS Risk Engine v2.0. Available at https://www.dtu.ox.ac.uk/riskengine/

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