**Comparing Clinical and Biochemical Features of Hyperglycaemic and Euglycaemic Diabetic Ketoacidosis associated with SGLT2-Inhibitors: A Systematic Review of Case Reports**

**Aims/Background**

The use of sodium-glucose co-transporter 2 inhibitors (SGLT2i) for Type 2 Diabetes Mellitus (T2DM) has increased the risk of diabetic ketoacidosis (DKA).(1) SGLT2i associated DKA is defined by acidaemia, ketonaemia and either euglycaemia or hyperglycaemia. This study aims to investigate the clinical and biochemical features of hyperglycaemic DKA (HDKA) and euglycaemic DKA (EDKA), exploring potential differences in both presentations.

**Methods**

PUBMED and EMBASE were searched for case reports published between January 2014 to April 2024 reporting either HDKA or EDKA in a T2DM patient using SGLT2i. The cases were grouped as HDKA if blood glucose level (BGL) ≥14 mmol/L, and EDKA if BGL <14 mmol/L. (2) Case reports were excluded if T1DM or latent autoimmune diabetes in adults were identified to contribute to the DKA.

**Results**

107 cases (HDKA=20, EDKA=87) were included. Mean age of patients was 49.95±13.99 years and 52.78 ± 12.97 years for HDKA and EDKA respectively. Mean BGL was 19.78±7.58 mmol/L and 9.57±2.37 mmol/L (p=0.001). HDKA group had significantly lower pH (7.02±0.12 vs 7.11±0.15 (p=0.013) and higher lactate (2.57±1.62 mmol/L vs 1.88±2.33 mmol/L, p=0.048). Malaise, tachypnoea, and polyuria was more common in HDKA (p<0.05). Fasting, dietary modifications, intercurrent illness, surgery and adjustments to insulin regimens were predominant precipitants of DKA, and their distribution was similar in both groups. Significant (p<0.05) correlations were observed between BMI and beta-hydroxybutyrate (r=-0.657), pH and bicarbonate (r=0.772), pH and base excess (r=0.678), and bicarbonate and base excess (r=0.829). Analysis of SGLT2i subgroups showed nausea, vomiting, polydipsia and polyuria was more common with Dapagliflozin when compared to Empagliflozin and Canagliflozin (p<0.05).

**Conclusion**

While both groups share similar characteristics, our results reflect potential underlying differences between both presentations, warranting further investigation. A more comprehensive understanding of SGLT2i induced DKA will allow for improved risk assessment and expediting diagnosis.

**Reference List**

1. Hamblin PS, Wong R, Ekinci EI, Fourlanos S, Shah S, Jones AR, et al. SGLT2 Inhibitors Increase the Risk of Diabetic Ketoacidosis Developing in the Community and During Hospital Admission. J Clin Endocrinol Metab. 2019;104(8):3077-87.

2. Australian Diabetes Society (ADS) NZSftSoDN. Periprocedural Diabetic Ketoacidosis (DKA) with SGLT2 Inhibitor Use. 2020.