**Ketone Profiles in Free-living People with Type 1 Diabetes using Continuous Ketone Monitoring**

**Aims:** To profile ketone levels in free-living people with type 1 diabetes (T1D).

**Methods:** Demographic, anthropometric, HbA1c and continuous glucose monitor (CGM, Abbott Freestyle Libre 2) data, and 5-minutely ketone profiles were assessed using a continuous ketone monitor (CKM, Abbott) during two-weeks run-in for the PARTNER study (ACTRN12624000448549), with SGLT2-inhibitor use excluded.

**Results:** Fifty participants 31 (62%) males; mean age 50.7 [41.0, 64.2] years; BMI 28.6 [26.7, 32.9] kg/m2; diabetes duration 26.5 [14.6, 37.6] years; total daily insulin dose 59.1 [43.3, 79.0] units have been studied. Ketone levels of 0.6-0.9mmol/L and ≥1.0mmol/L were recorded by 13/50 (26%) and 8/50 (16%) of participants respectively. There were no significant differences between groups according to age, sex, duration of diabetes, type of insulin treatment, BMI, HbA1c and average total daily insulin doses. In those with ketones ≥1.0mmol/L, 7/8 (87.5%) had T1D ≥10 years and BMI >25 kg/m2, 5/8 (62.5%) used automated insulin delivery systems and had HbA1c >7.0% (53mmol/mol). Greatest time spent with ketones ≥1.0mmol/L was 2.4% and the highest ketone level recorded was 1.4mmol/L.

**Conclusion:** The majority of stable free-living T1D adults not on SGLT2 inhibitor had normal ketone levels. Elevated BMI and ≥10-year diabetes duration was associated with ketone levels ≥1.0mmol/L.

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| **Metabolic Metrics** | **(n=50)** |
| HbA1c % / mmol/mol | * 1. (6.8, 8.2) / 56 (51, 66) |
| CGM TIR 3.9-10.0 mmol/L, %  CGM TBR <3.9 mmol/L, %  CGM TAR >13.9 mmol/L, %  Average glucose (mmol/L) | 71.0 (59.25, 83.0)  2.0 (1.0, 4.0)  4.0 (1.0, 10.75)  8.1 (7.3, 9.4) |
| CKM Time <0.6 mmol/L, %\*  CKM Time 0.6-0.9 mmol/L, %\*  CKM Time 1.0-1.5 mmol/L, %\*  Time with high ketones ≥1.6 mmol/L, %\* | 100.0 (92.3, 100)  0.0 (0.0, 5.3)  0.0 (0.0, 2.4)  0.0 (0.0, 0.0) |

**Table 1: Baseline glycaemic and continuous ketone data**. CGM = continuous glucose monitor; CKM = continuous ketone monitor; TAR = time above range; TBR = time below range; TIR = time in range. Continuous data presented as median (interquartile range), except for CKM data. \*CKM data was presented as median (minimum, maximum) as first and third quartile were the same as median

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**Tables: 1**