Closed-loop therapy in older adults with type 1 diabetes: hypoglycaemia benefits and risk stratification

We read with interest the Comment in *The Lancet Healthy Longevity* by Richard Pratley and Anna Casu questioning whether technology can improve the management of type 1 diabetes in older adults.[1] Although the authors draw attention to important points, two key considerations warrant further reflection.

The first is hypoglycaemia. Pratley and Casu highlight the importance of what they consider to be the first randomised closed-loop trial in older individuals, reported in the same issue.[2] A caveat in their Comment is the absence of hypoglycaemia benefit with this new therapeutic technology. We agree with Pratley and Casu that hypoglycaemia prevention is a critically important area in the management of older adults. We therefore wish to highlight findings from the ORACL multicentre randomised trial, involving 30 older adults with type 1 diabetes and reported in 2021, demonstrating reduced hypoglycaemia with closed-loop therapy.[3] Using a first-generation closed-loop system (MiniMed 670G; Medtronic, Northridge, CA, USA), hypoglycaemia (<3·9 mmol/L) was reduced by median 0·5 percentage points (95% CI 0·3–1·1; p=0·0005) compared with sensor-augmented pump therapy in the ORACL trial; strikingly, there was a three-fold reduction in hypoglycaemia overnight with closed loop.

The second is risk stratification when considering effects of diabetes technology among older adults. There is increasing awareness of the importance of risk assessment when considering treatment and clinical targets for older adults with type 1 diabetes.[4] Recommendations by Sinclair and colleagues specifically support the consideration of frailty, a state of increased vulnerability and low resilience to adverse health outcomes, in the routine delivery of diabetes care.[5] In the ORACL trial, 20% of participants had mild cognitive impairment and one-third had impaired awareness of hypoglycaemia; none were frail or malnourished, although 20% were prefrail and 13% were at risk for malnutrition.[3] Risk assessments were limited in the older adult closed-loop trial report by Boughton and colleagues, reducing the clinical applicability of these results.[2] We propose that studies involving older adults need to sufficiently characterise the cohort studied, including their clinical, cognitive, frailty, and functional status, to allow clinical contextualisation of results.

In conclusion, discordant randomised trial evidence for closed-loop therapy effects on hypoglycaemia in older adults with type 1 diabetes warrants further examination. Whether differences in the cohorts studied, differences between closed-loop algorithms, or other factors contributed to the inconsistent hypoglycaemia effects remains to be determined. Moreover, detailed characterisation of older adult participants is paramount to interpretation of diabetes technology clinical trial results and their application to clinical practice.

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1 Pratley RE, Casu A. Can technology improve the management of older adults with type 1 diabetes? Yes, but.... *Lancet Healthy Longev* 2022; **3:** e120–21.

2 Boughton CK, Hartnell S, Thabit H, et al. Hybrid closed-loop glucose control compared with sensor augmented pump therapy in older adults with type 1 diabetes: an open-label multicentre, multinational, randomised, crossover study. *Lancet Healthy Longev* 2022; **3:** e135–42.

3 McAuley SA, Trawley S, Vogrin S, et al. Closed-loop insulin delivery versus sensor-augmented pump therapy in older adults with type 1 diabetes (ORACL): a randomized, crossover trial. *Diabetes Care* 2022; **45:** 381–90.

4 Sinclair AJ, Dunning T, Dhatariya K, et al. Clinical guidelines for type 1 diabetes mellitus with an emphasis on older adults: an Executive Summary. *Diabet Med* 2020; **37:** 53–70.

5 Sinclair A, Bellary S, Dhatariya KK. Diabetes in older adults – time to include frailty as a care indicator. *Diabet Med* 2021; **38:** e14560.