Short-term and long-term impact of continuous subcutaneous insulin infusion therapy on HbA1c changes in Type 1 diabetes

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Introduction

- Continuous subcutaneous insulin infusion therapy (CSII) has been proven to be superior over intensified insulin therapy using multiple daily injections [1]
- Studies are showing conflicting data on long-term follow-up of CSII therapy, from sustained benefit over 6 years [2] to loss of it after 3 years [3]
- Our aim was to assess both the short-term and long-term impact of CSII on HbA1c changes in Type 1 diabetes

Methods

- Retrospective, observational study of 517 adults with Type 1 diabetes starting on CSII between 2002 and 2017
- Exclusion criteria were unavailability of baseline HbA1c and at least one follow-up HbA1c level - 474 eligible patients in total
- Comparisons were made between subgroups classified by baseline HbA1c level:
  - ≥69 mmol/mol
  - 58.5-69 mmol/mol
  - <58.5 mmol/mol

Results

CSII provides sustainable improvement of HbA1c levels

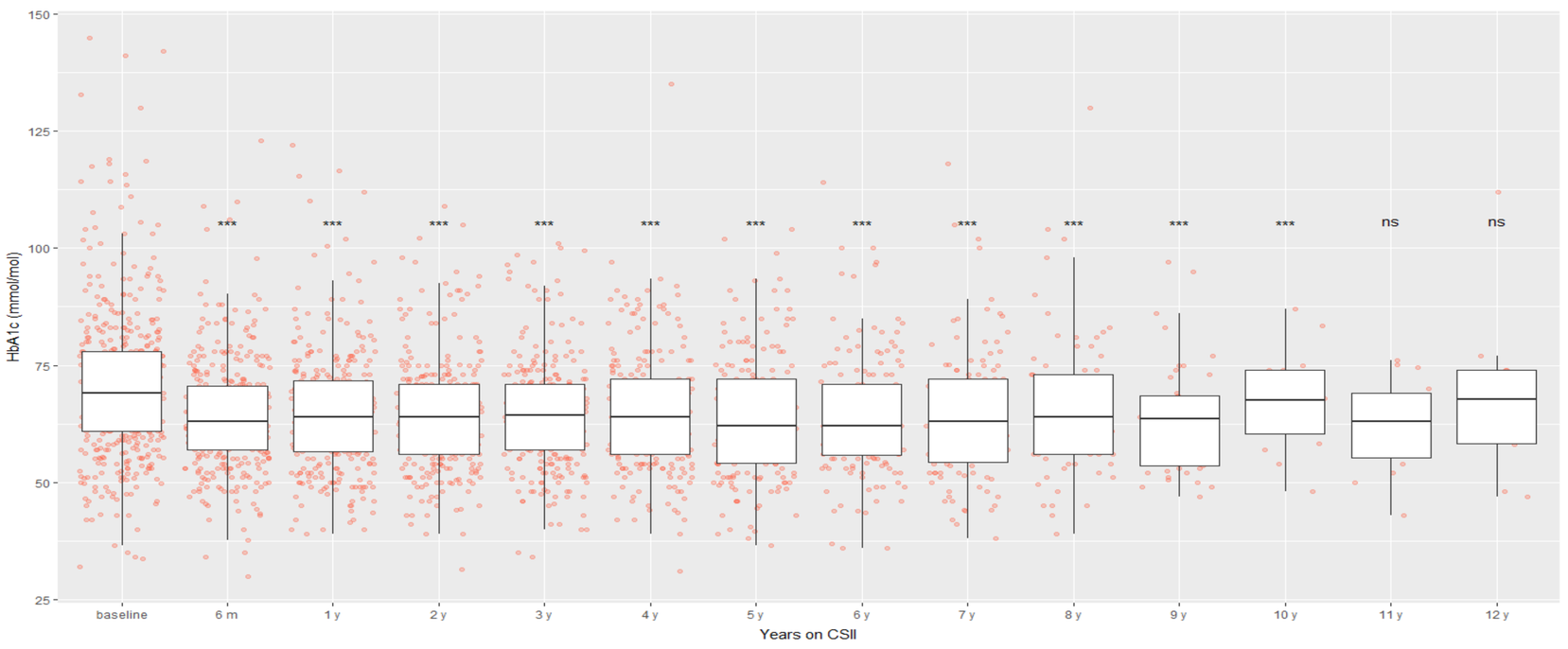

Figure 1: Effect of CSII initiation on median overall HbA1c levels. Red points show raw data for each individual
*(Wilcoxon signed-rank test, *** p<0.001, ns - not significant, p>0.05)*

CSII initiation improved poorly controlled DM

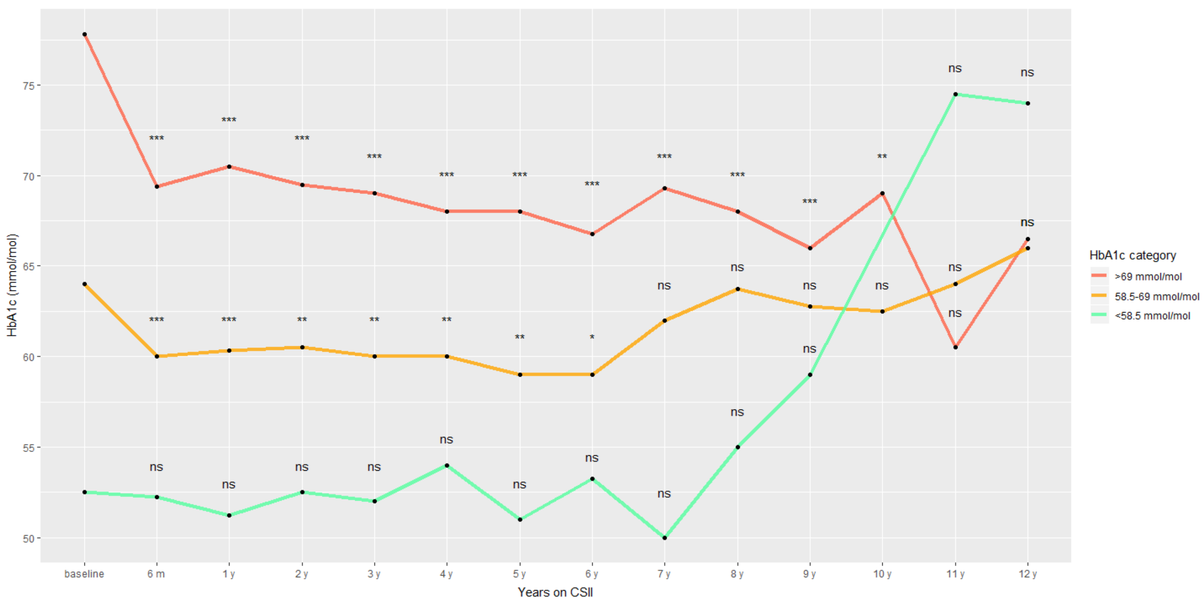

Figure 2: Effect of CSII initiation on median HbA1c levels by HbA1c category
*(Wilcoxon signed-rank test, *** p<0.001, ** p<0.01, * p<0.05, ns - not significant, p>0.05)*

Pump change did not alter HbA1c levels further

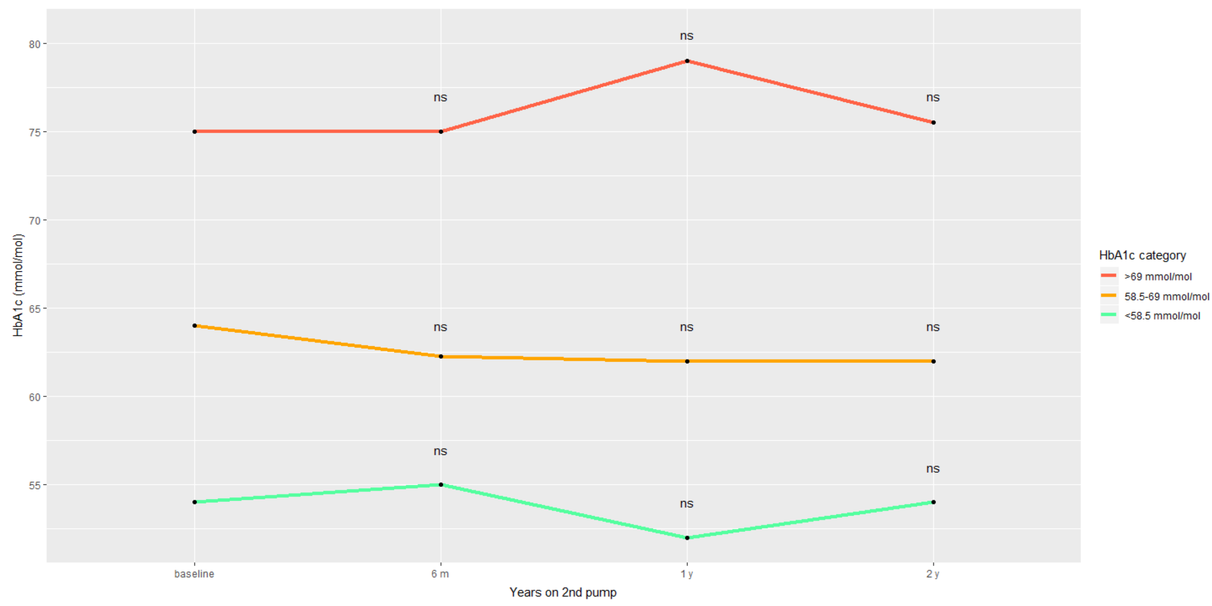

Figure 3: Effect of pump change on median HbA1c levels by HbA1c category
(Wilcoxon signed-rank test, ns - not significant (p>0.05))

Conclusions

- CSII initiation significantly improved HbA1c levels after 6 months with sustainable effects lasting up to 10 years
- Patients more likely to benefit the most from CSII are those with prior poor glycaemic control
- Switching pump models at end of initial warranty did not significantly change glycaemic control irrespective of HbA1c category on switch

References:

1. Pozzilli P., Battelino T., Danne T. et al. Continuous subcutaneous insulin infusion in diabetes: patient populations, safety, efficacy, and pharmacoeconomics. Diabetes Metab Res Rev. 2016 Jan:32(1):21-39.
2. Beato-Víbora P., Yeoh E., Rogers H. et al. Sustained benefit of continuous subcutaneous insulin infusion on glycaemic control and hypoglycaemia in adults with Type 1 diabetes. Diabetic Med. 2015 Nov;32(11):1453-9.
3. Papargyri P., Ojeda Rodríguez S., Corrales Hernández JJ. Et al. An observational 7-year study of continuous subcutaneous insulin infusion for the treatment of type 1 diabetes mellitus. Endocrinol Nutr 2014 Mar; 61:141-146.