

Continuous subcutaneous insulin infusion therapy: Long-term impact upon plasma HbA_{1c}, lipids, lipoproteins and blood pressure

R.J. Webb¹, I. G. Davies¹, T. S. Purewal², P. J. Weston², G. Morrison² and J. C. Abayomi¹
¹Liverpool John Moores University, Faculty of Education, Health & Community, Barkhill Road, Liverpool, L17 6BD
 and ²Royal Liverpool and Broadgreen University Hospital, Prescot Street, Liverpool, L7 8XP

Patients with Type 1 diabetes and poor glycaemic control frequently display unfavourable lipid profiles and blood pressure, increasing the risk of premature atherosclerosis development and cardiovascular disease⁽¹⁾. Conversely, patients possessing optimal glycaemic control display lipid profiles comparable to those without diabetes⁽²⁾. Continuous subcutaneous insulin infusion (CSII) has been shown to improve glycaemic control and potentially allow the relaxation of diet; however there have been few studies investigating the long-term plasma lipid profiles and blood pressure of patients using the therapy⁽³⁾. Medical records containing routine plasma HbA_{1c}, lipid, lipoprotein and blood pressure measurements from patients undergoing CSII therapy at the Royal Liverpool and Broadgreen University Hospital were utilised. Lipid and lipoprotein data contained in these records spanning an 8 year period (4 years prior to CSII and 4 years after) were analysed within SPSS software using descriptive statistics. HbA_{1c} and blood pressure information was collected using the same methods; however data for these risk markers were only available for the 4 years after commencement of CSII therapy.

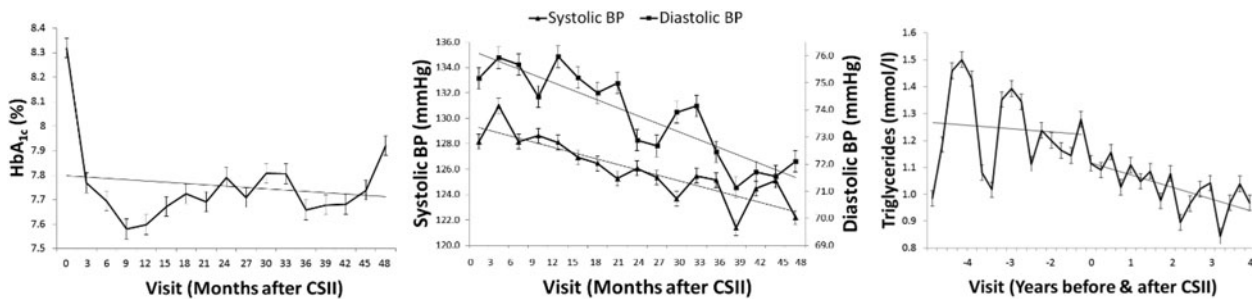


Fig. 1. Changes in HbA_{1c}, systolic & diastolic blood pressure and triglycerides upon commencement of CSII.

The study population consisted of 261 patients (33.7% male, 66.3% female); mean age 45±14 years. Fig. 1 shows mean reductions in HbA_{1c} from 8.3 to 7.9% upon commencement of CSII and mean reductions in systolic and diastolic blood pressure from 128 to 122 mmHg and 75 to 72 mmHg respectively. Furthermore, mean plasma triglycerides increased from 1.0 to 1.3 mmol/l prior to CSII and then decreased to 1.0 mmol/l after the commencement of CSII. An increase was seen in total cholesterol from 4.0 to 4.3 mmol/l prior to CSII; however reductions to 4.0 mmol/l were seen thereafter. LDL increased from 1.9 to 2.1 mmol/l prior to CSII and consequently stabilised at 2.1 mmol/l. HDL remained at 1.7 mmol/l both before and after starting CSII. These findings are in agreement with existing literature which suggests CSII often improves glycaemic control. The results also indicate favourable improvements in lipid profile and blood pressure upon commencement of CSII, which may in turn lead to a reduction in cardiovascular disease risk.

1. Dullaart R.P. (1995) *The Netherlands Journal of Medicine*, 46 44–54.
2. Vergès B. (2009) *Diabetes & Metabolism*, 35 353–60.
3. Department of Health (2007) *Insulin Pump Services: Report of the Insulin Pumps Working Group*.