

Three-times-weekly insulin therapy: the Hammersmith haemodialysis experience

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Introduction

- Diabetic nephropathy is the most common cause of end-stage renal disease; therefore a significant proportion of patients entering most renal replacement programs will now have diabetes mellitus.
- Insulin resistance and reduced insulin clearance predisposes to swings in glycaemic control in diabetic nephropathy; however, haemodialysis results in improved insulin sensitivity. Glycaemic control is therefore difficult to achieve in the context of haemodialysis and the optimal treatment regimen is not known.
- We now know that running these individuals “too tight” can do them adverse harm (2016 JBDS guideline).

Our experience

- At Hammersmith Hospital, the largest renal and transplant service of its kind in Europe, we have found three-times-weekly insulin Degludec therapy to be highly successful for certain patients with type 2 diabetes undergoing haemodialysis three times a week.
- A long-acting insulin analogue is administered after haemodialysis with the aim of controlling glycaemia using three insulin injections weekly and can be used alongside oral hypoglycaemics.

Example 1: 60 year old caucasian male

Profile:

- Type 2 diabetes of long duration
- End stage renal failure due to diabetes
- Retinopathy
- Hypertension
- Previous alcohol excess with Korsakoff's dementia

Diabetes:

- Within 12 months: 5 admissions, 2 A&E attendances and 1 ambulance callout – generally related to hypoglycaemia
- Tried Humulin M3, Novomix 30 and Humulin I
- Variable glucose levels ranging from 2mmol/L to 28 mmol/L
- Erratic eating pattern

Result:

- Switched to Degludec insulin and oral hypoglycaemic agents discontinued
- Given three times per week with dialysis session
- HbA1c:
February 2016: 90 mmol/mol
July 2016: 57 mmol/mol
- After the changeover, no subsequent hospital admissions related to diabetes.

Example 2: 43 year Black African male

Profile:

- Type 2 diabetes for 10 years
- End stage renal failure
- Retinopathy: registered blind
- Ischaemic heart failure: 60% stenosis of LAD
- Depression
- BMI 19.6
- History of violence to health care staff

Diabetes:

- Erratic control
- Nocturnal hypoglycaemia
- Exacerbated by Gliclazide

Result:

- Switched to Degludec insulin: 6 units
- Given three times per week with dialysis session
- HbA1c:
February 2015: 76 mmol/mol
February 2016: 57 mmol/mol
- After the changeover: glycaemic control stabilized, economical benefits from the money saved in no longer requiring District Nurse input, and saved District Nurse staff from being attacked (!)

Discussion

- Compared with reno-competent comparatives, these diabetic patients with renal insufficiency have a longer excretion time of insulin; meaning that the administered insulin continues to work in the period between haemodialysis sessions.
- We have found that due to the long-acting nature of the insulin used, our patients have a flatter glycaemic profile and experience fewer episodes of hypoglycaemia.
- This regimen is cost effective and reduces demand on the district nurse service administering insulin. This is particularly important at a time of staff capacity shortages.
- People who may be suitable:
 - Frail and elderly
 - Visually impaired
 - Individuals with cognitive impairment / dementia
 - Individuals who are on maximum oral hypoglycaemic agents
 - Individuals already being seen by the District Nursing team
 - Individuals who have been on multiple insulin regimens with little effect
 - Individuals struggling with insulin/diabetes management at home due to social reasons
 - Individuals who are not for transplantation
- We do not advocate this treatment for people awaiting transplantation, who require tighter glycaemic control.