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Use of octreotide as a novel treatment for insulin overdose in a non-diabetic patient

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Insulin overdose

- Rare
- PK: Prolonged absorption
- Clinical Effects
 - profound hypoglycaemia, coma, seizures
- Treatment: IV glucose
 - relatively simple in diabetics
 - more complex in non-diabetics
- Non-diabetics
 - difficulty is determining when to stop glucose

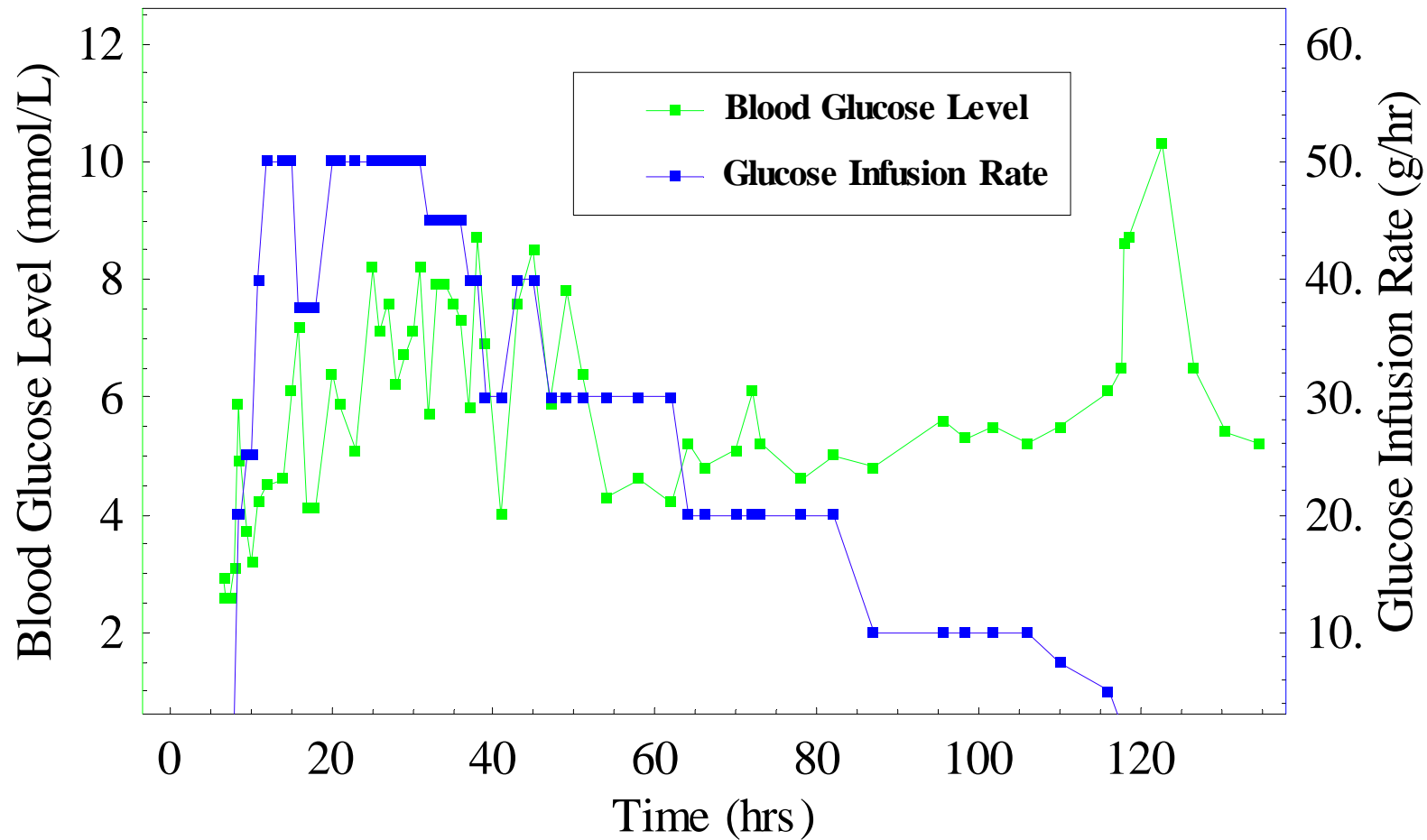
Case 1

- 28 years, non-diabetic woman
- Accessed insulin by impersonating a diabetic relative
- 5000 units Mixtard 30/70[®] over previous several hours
- Had eaten sugary foods but became sweaty and drowsy nonetheless

Management

- Initial BGL 2.6 mM
- 50ml bolus of 50% glucose IV
 - infusion of 50% glucose via CVL
- 600 gms of IV glucose over 9.5hr
- Slow to wean off IV glucose
- D4: BGL 4-5mM despite 10g/hr IV glucose

Patient 1 - BGL and Glucose Infusion rate



Patient 1 - Insulin and C-Peptide

	Day 1	Day 4
	1425	1530
Insulin (mIU/L)	2769	41.6
C-Peptide (mcg/L)	0.7	3.8

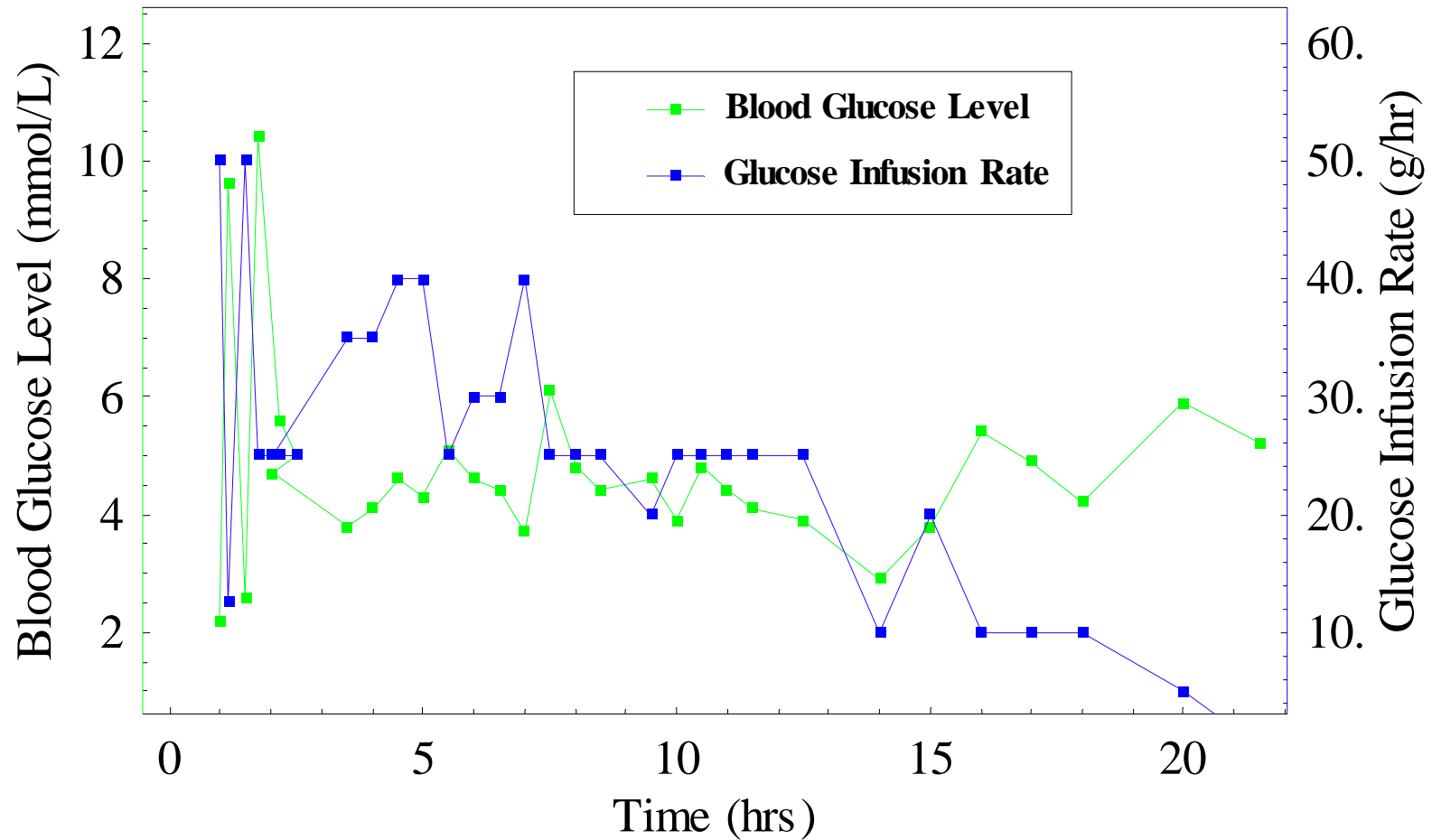
Case 2

- 18 years non-diabetic woman
- Multiple presentations with insulin OD
- Insulin accessed from diabetic partner
- Injections of 1500-5400 units of insulin in combinations of rapid- and intermediate-acting preparations

Case 2 – Admission 1

- Injected 1800 U insulin aspart 40min prior
- BGL 2.2 mM
- Given 50% IV glucose bolus; glucose infusion commenced
- Glucose infusion overnight in ICU
- Regular BGL monitoring

Admission 1 - Glucose infusion only



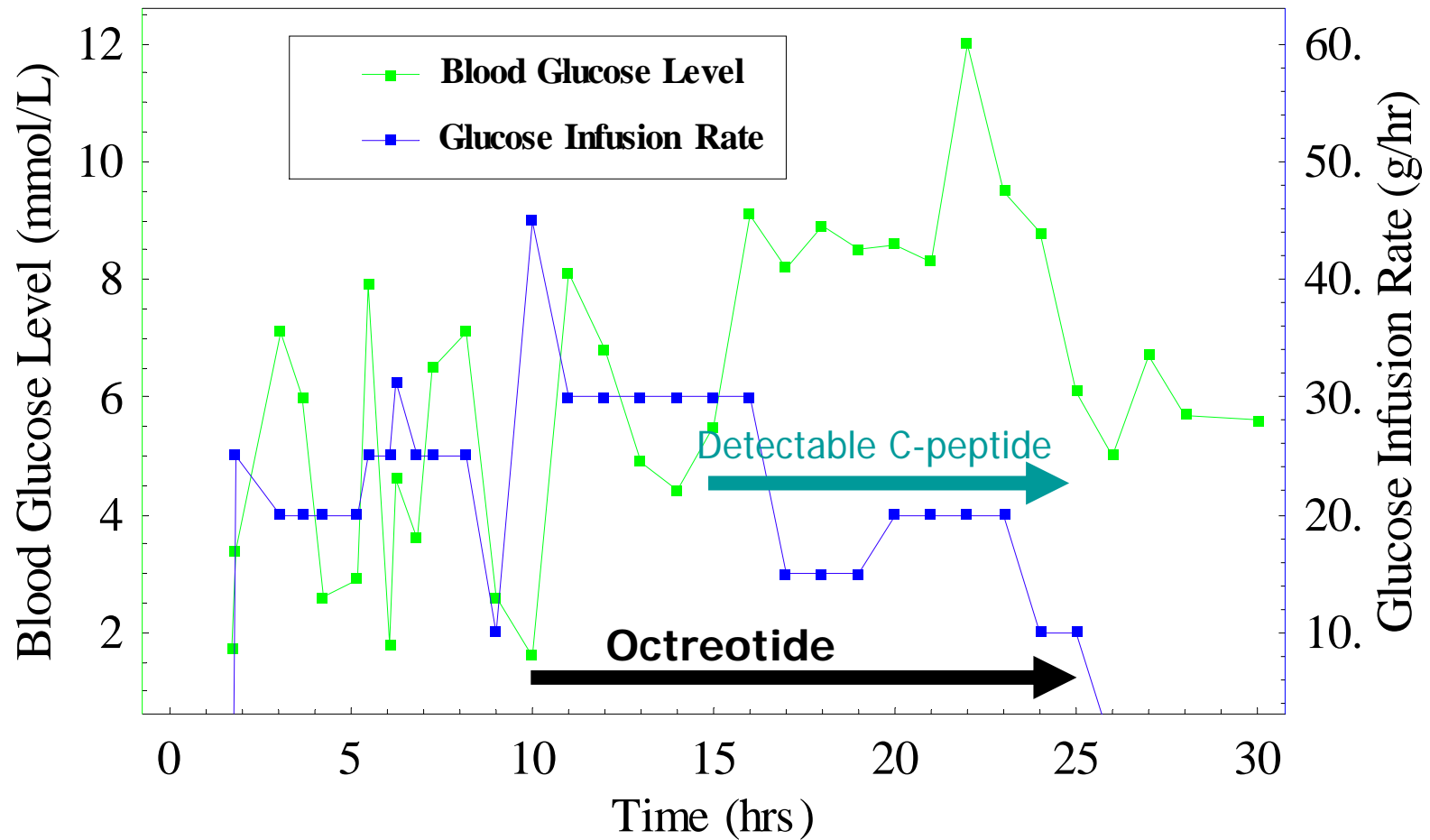
Case 2 - Admission 3

- Injected 1500 units insulin aspart.
- BGL 1.7 mM – aggressive & agitated.
- 50% glucose infusion titrate to BGL 4 – 11 mM
- As BGL increased, glucose infusion decreased and ceased

“If only she were diabetic”

- “Turning off” endogenous insulin may help make the decision to stop the glucose easier and safer
- May reduce length of time on glucose
- Octreotide used in sulfonylurea OD
 - Infusion at 25mcg/hr commenced 10 hr post OD

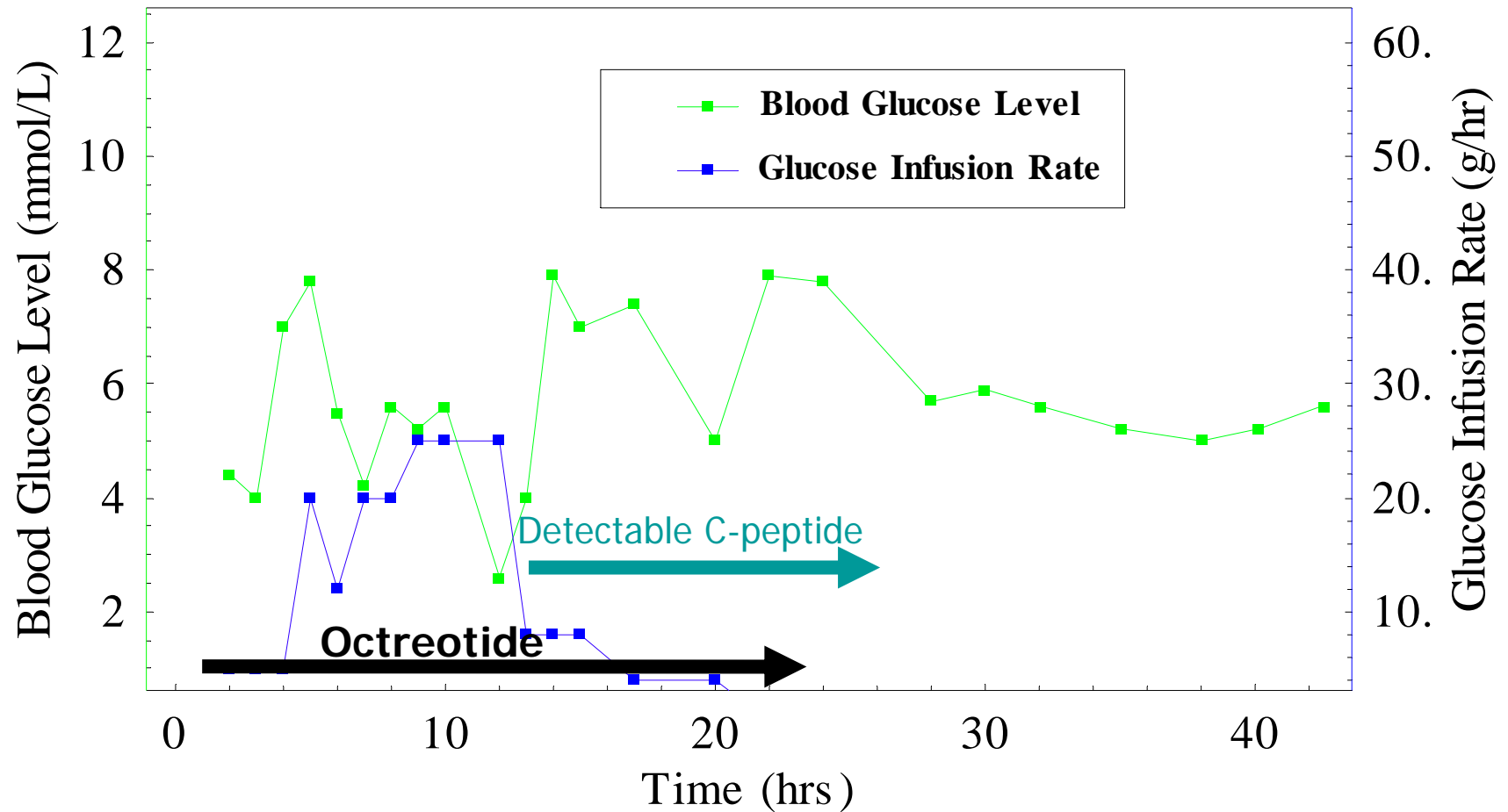
Admission 3 - Glucose + Octreotide




Fourth Admission

- Admitted 0920 hrs
- OD amitriptyline & 1500 U insulin aspart
- Undetermined time of ingestion
- BGL 4.5mM
- Admitted to ICU
 - treated for delirium & insulin overdose


Admission 4 - Glucose + Octreotide







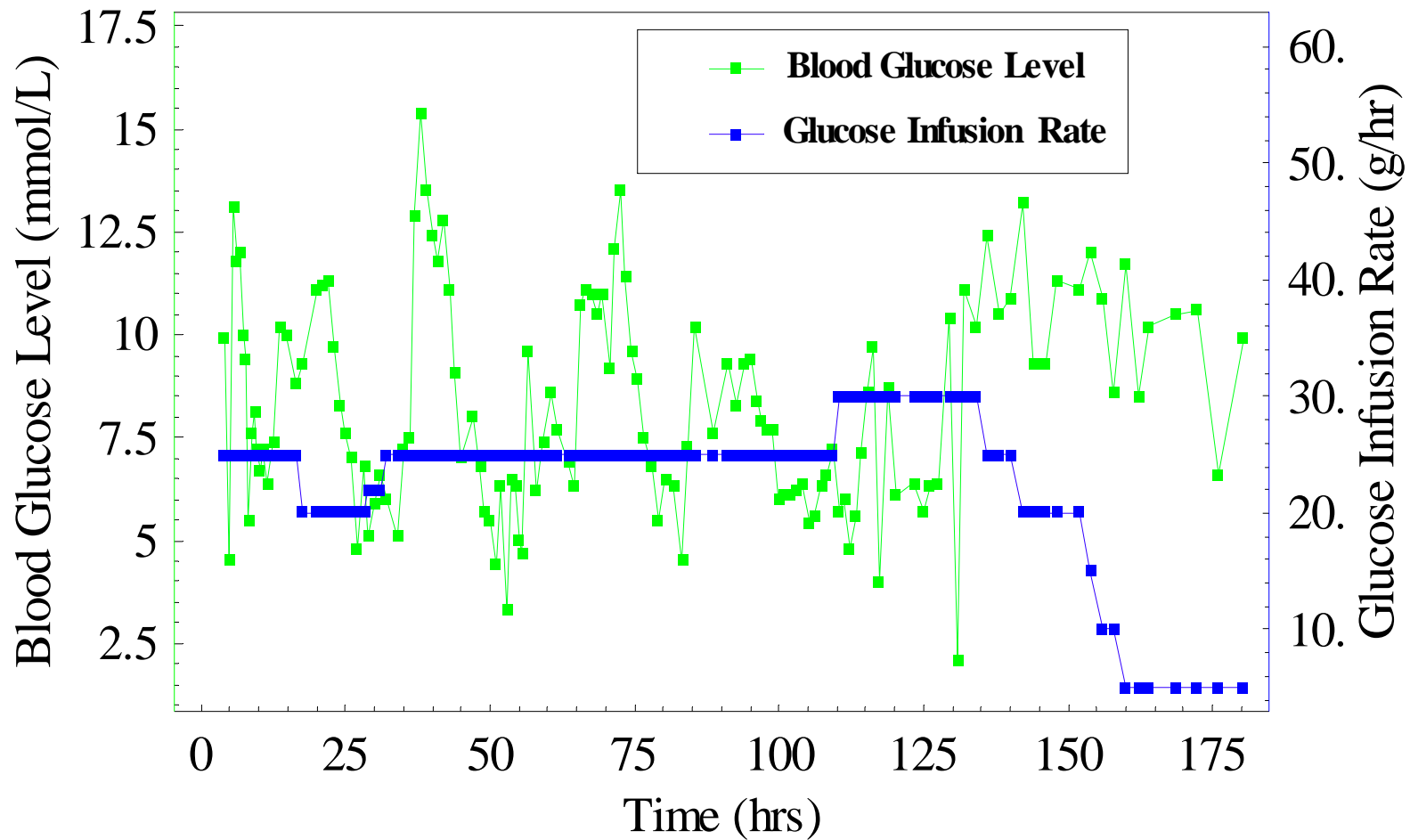
**What is the difference
between insulin overdose in
diabetics versus non-
diabetics?**



Management in Diabetics

- Prolonged absorption and hypoglycaemia
- Conventional treatment
 - easy to titrate glucose infusion to BGL
- Management simple
 - diabetic pancreas cannot produce insulin
- BGL increases as exogenous insulin eliminated


Insulin OD in a diabetic




1800U lispro/ 3000U ultralente

In Non-Diabetics Homeostasis Supervenes

- Major stimulus for insulin release is blood glucose
- Non-diabetics continue to secrete insulin in spite of high blood insulin levels
- BGL remains in normal range on glucose infusion



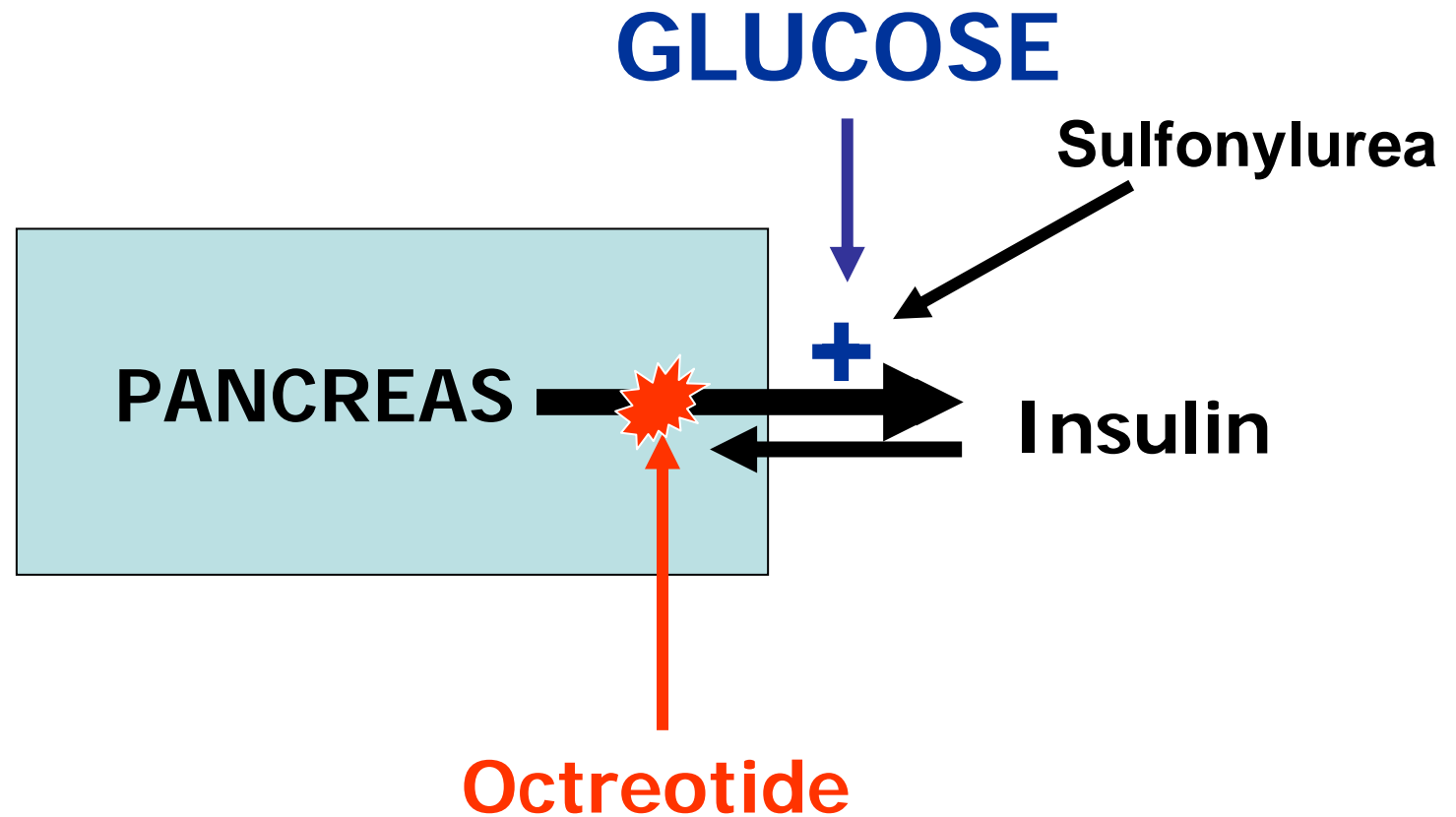
**What is the mechanism of
action of octreotide in this
situation?**



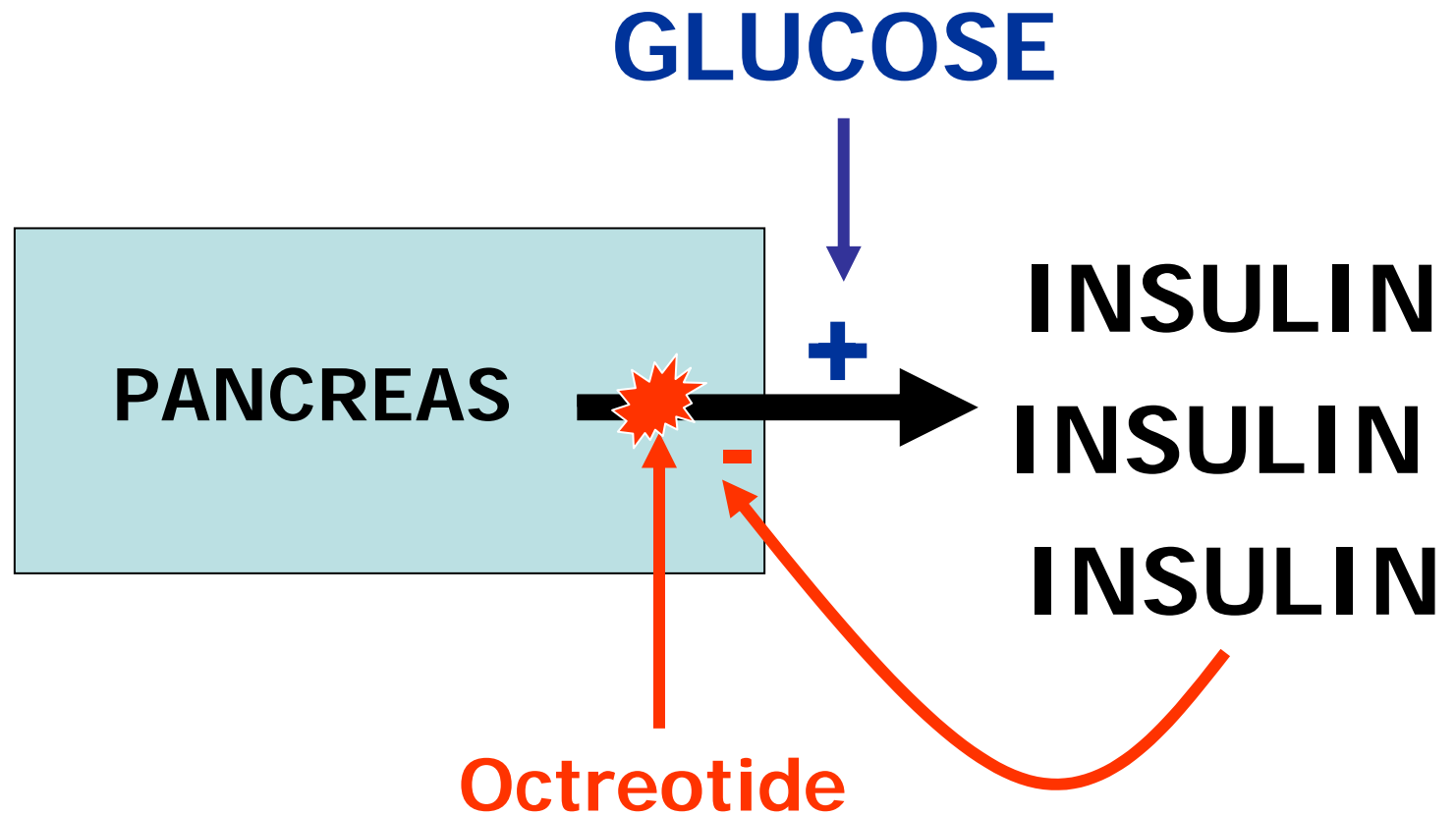
Octreotide

- Somatostatin analogue
- Inhibits production of insulin, GH, glucagon
- Used in treatment:
 - acromegaly, carcinoid and insulinoma
 - no reports of significant S/Es
- Sulfonylurea poisoning
 - “breaks the cycle” of insulin secretion in response to high BGL

Octreotide's effect on Insulin secretion



Octreotide's effect on Insulin secretion



SO - “If only she were diabetic”

- Aim
 - simplify treatment by turning patient into a diabetic
- Mechanism
 - turn off the pancreas with octreotide
- Management
 - increased BGL on stable amount of IV glucose

Have we achieved anything?

- Aim
 - **Inconclusive**: To reduce time dependent on IV glucose & length of stay
 - **Inconclusive**: Reduce amount of glucose required
 - **Possible**: Achieved mild increase in BGL stability with treatment

Case 2 - Admission 13

