

# Hyperosmolar Hyperglycaemic state following Diazoxide therapy for Insulinoma

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## Background

Insulinoma's are the most common functioning neuroendocrine tumors of the pancreas. They are rare tumors occurs in 1-4 people per million in general population. Insulinoma's are insulin secreting tumors causing fasting hypoglycemia. Hyperglycemic hyperosmolar State( HHS) has been reported in patients treated with diazoxide for hypertension. To our knowledge, this is a first case report where HHS has developed as a complication of diazoxide therapy for insulinoma.

## Case Presentation

### History

A 67-year-old lady was admitted through her General Practitioner with a history of reduced oral intake & unresponsiveness. She was diagnosed to have an insulinoma in 2012 and has been on diazoxide 75 mg thrice daily as she was deemed to be unfit for any surgical intervention.

### Examination

She was pyrexial, tachycardic, hypoxic and had an initial GCS of 3. She was noted to have shingles on her chest & right basal coarse crackles.

### Investigations : (on admission)

Elevated levels of Blood glucose : 44 mmol/L , serum sodium :162 mmol/L, Urea : 32 mmol/L, Creatinine:162 umol/L and a Serum osmolality of 408 mmol/kg . Positive varicella zoster (VZ) PCR & right lower lobe consolidation on CTPA. Her HbA1c was 39 mmol/mol suggestive of acute metabolic de-compensation.

### Treatment

The above clinical & investigation findings supported a diagnosis of **Hyperosmolar hyperglycemia state (HHS)** triggered by pneumonia & VZ infection . She was given IV fluids, IV antibiotics, variable rate IV insulin infusion & IV acyclovir. Her Diazoxide was stopped on admission.

### Clinical Course

Diazoxide was believed to be a potential agent precipitating HHS in our patient through its inhibitory effect on pancreatic insulin release & subsequent uninhibited glycogenolysis. In our patient, the effect was likely to have been amplified by sepsis triggering adrenocortical and catecholamine release potentiating further glycogenolysis.

She recovered well in the next 48 hours and was discharged home. Unfortunately she was re-admitted again few days later and died in hospital due to bronchopneumonia.

## Discussion

Insulinoma's represents 1-2% of all pancreatic neoplasms. Upto 90% has been reported to be benign, intrapancreatic & < 2cm in size.

### Management :

**Surgical :** curative – Eucleation/pancreatic resection

**Medical :** Patients who refuses surgery, Unfit for surgery

Pre – operative symptomatic Rx

Uncured by surgery : multiple insulinoma's

Un-resectable malignant insulinoma

EUS-guided alcohol ablation

CT-guided RFA

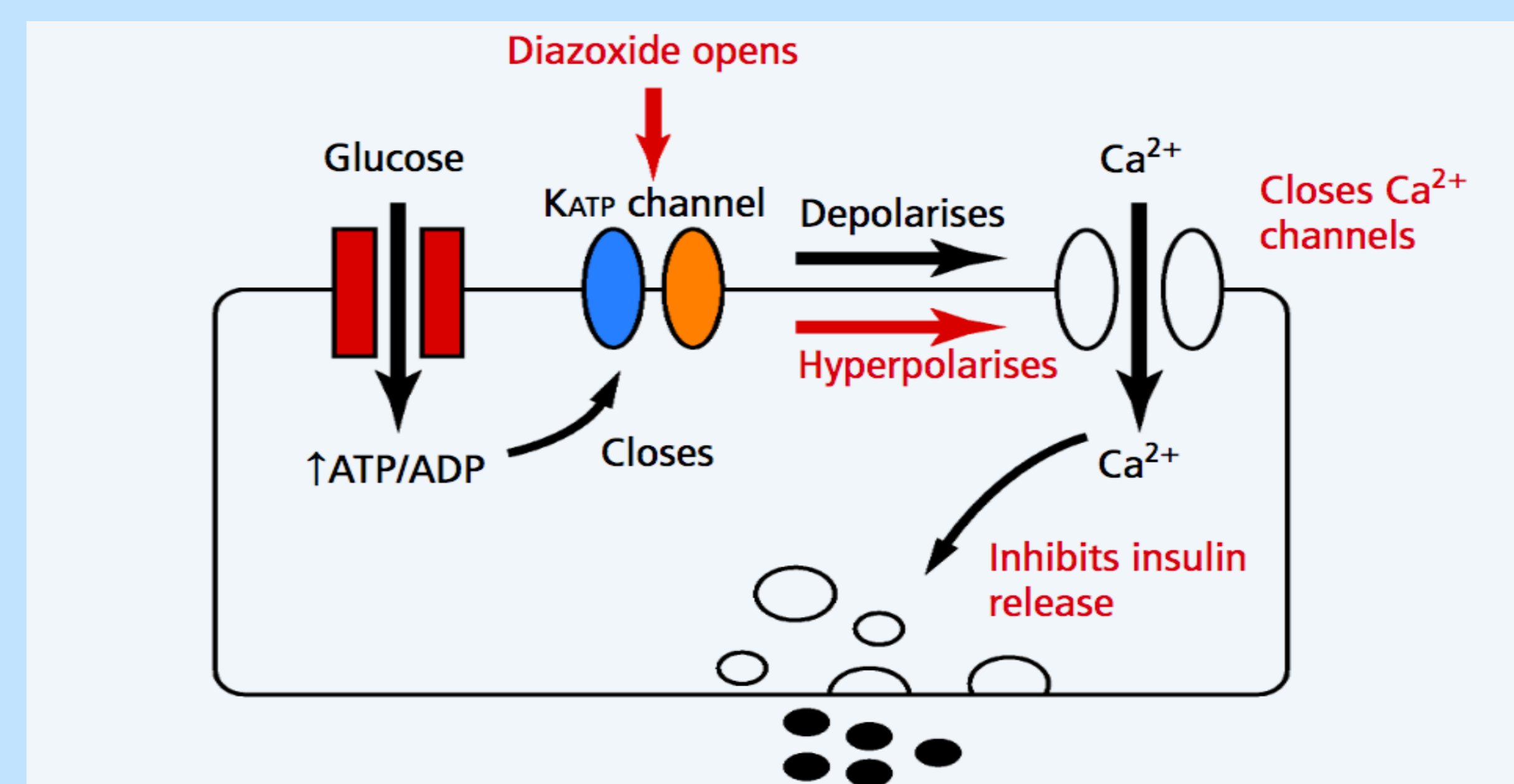
Embolization

Octreotide

**Diazoxide**



### Mechanism of action of Diazoxide



- Diaz offers symptom control in 50-60% of patients
- DKA & HHS has been reported in hypertensive patients treated with usual dose of Diazoxide usually during intercurrent illness.
- Monitoring required up to 30hrs because of long half life
- Prevention: educate patients to monitor glucose & ketones

## Conclusion

To our knowledge this is a first case report of this kind where HHS has developed as a complication of diazoxide therapy for insulinoma. This case warns the possibilities and dangers of diazoxide therapy and highlights the importance of monitoring blood glucose & ketones particularly during intercurrent illnesses.

**Reference:** [Takehiro Okabayashi](#), [Yasuo Shima](#) et al. Diagnosis and management of insulinoma. *World J Gastroenterol.* 2013 Feb 14; 19(6): 829–837.

[Priya George](#) et al. Diazoxide. *Practical Diabetes International*, Vol. 29, No. 1, 01.01.2012, p. 36-37.

