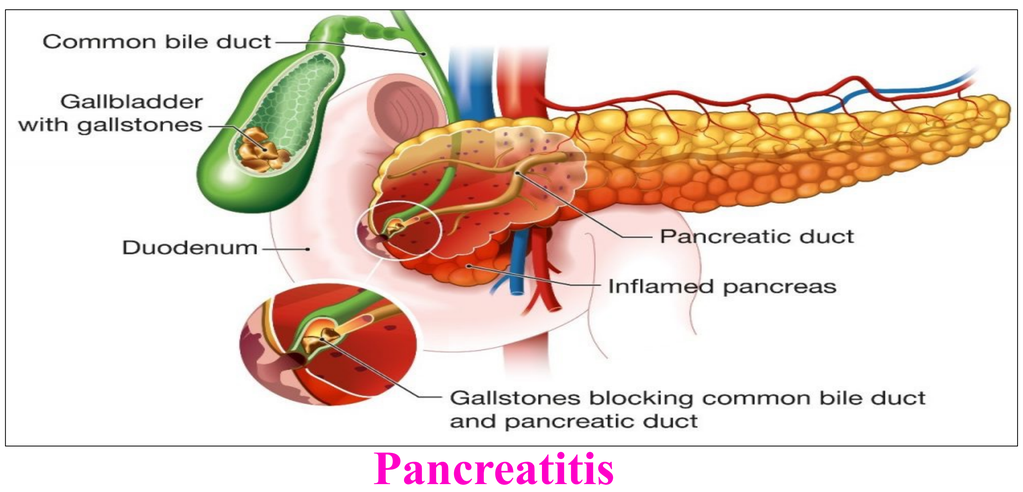
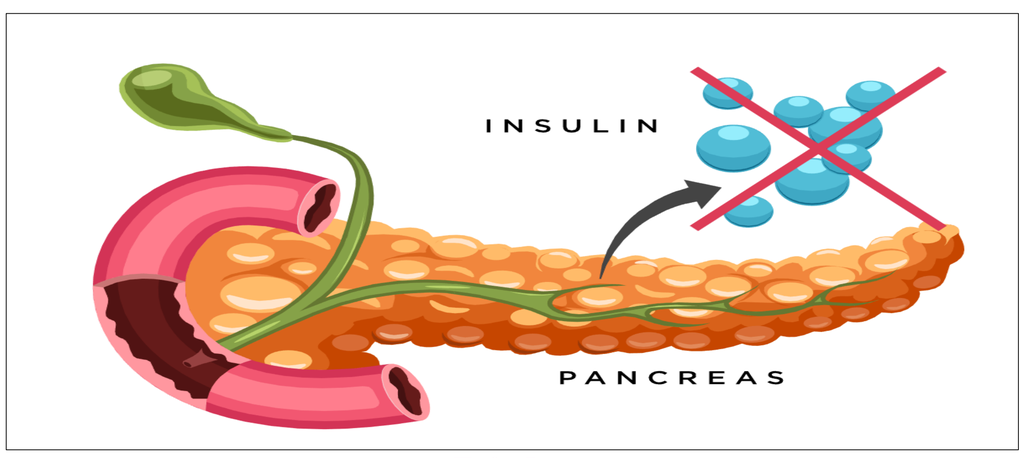
From Plate to Protection: *Sprotone's Role in Safeguarding Against Acute Pancreatitis and Diabetes*

Rinta Mathew and Jason I. E. Bruce From Faculty of Biology, Medicine and Health, The University of Manchester, Manchester, United Kingdom

Pancreatitis and Diabetes



Pancreatitis



Diabetes

Current UK Burden

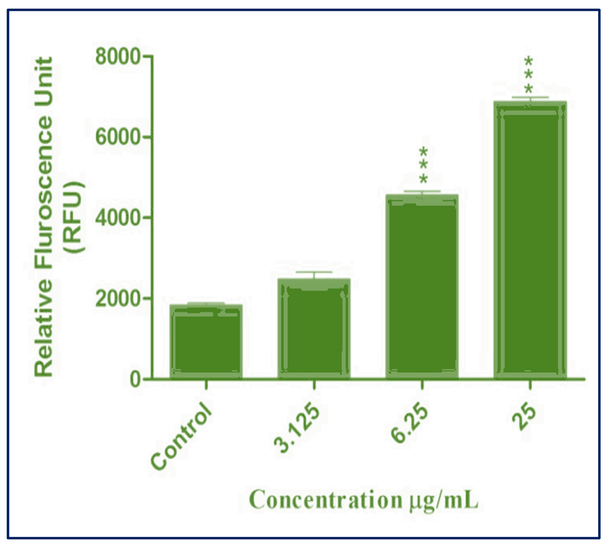
20,000 patients are diagnosed with Acute pancreatitis every year in the UK resulting in 1000 deaths.

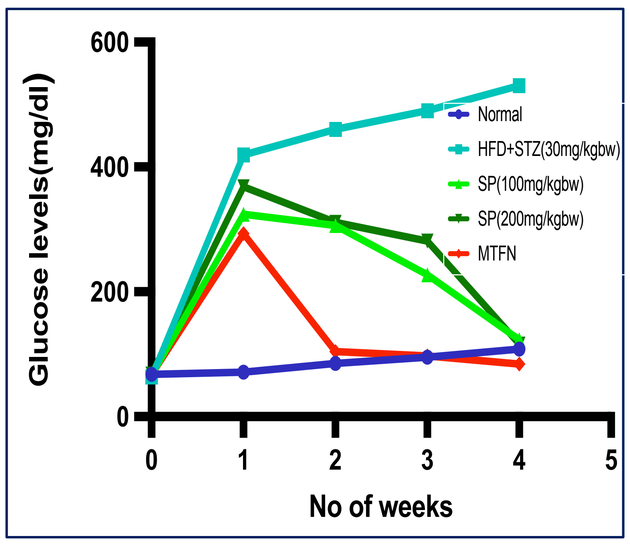
4.6 million people are living with diabetes in the UK.

Diabetes costs the NHS around £10 billion each year and Acute pancreatitis costs £200 million each year.

Why is this important?

- There is no immediate cure for acute pancreatitis and treatment is restricted to intravenous fluid and nutritional support.
- Our previous studies have shown that insulin directly protects acinar cells during cellular and *in vivo* models of Acute Pancreatitis(AP).
- Insulin infusion might seem like a simple therapeutic solution for acute pancreatitis but is very precarious in critically ill patients.
- Therefore, agents that mimic the effects of insulin in pancreatic acinar cells without the deleterious systemic effects, may be an alternative therapeutic strategy for the treatment of AP.



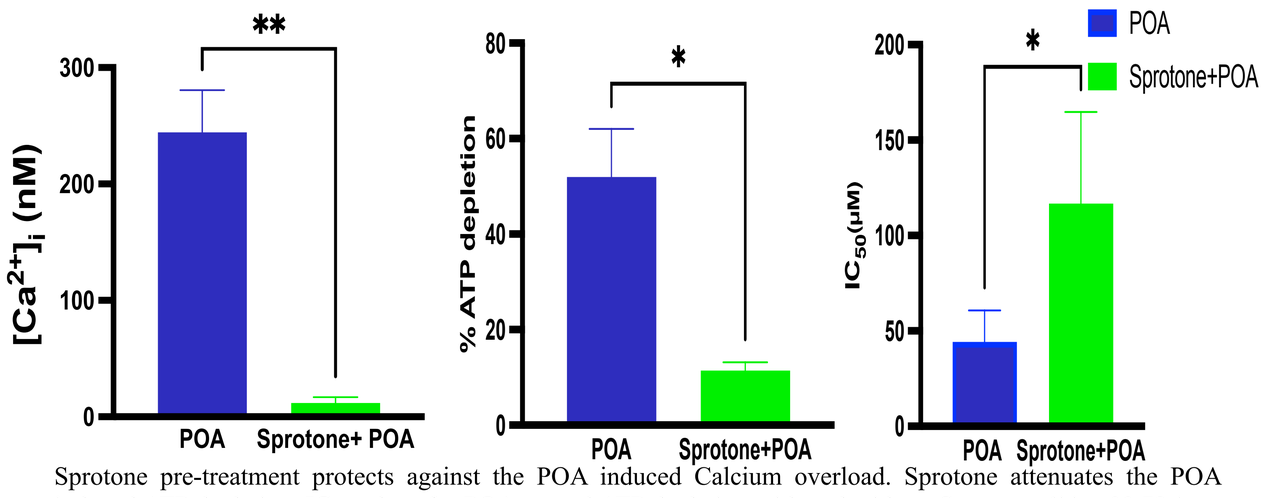


Sprotone treatment caused a dose-dependent increase in glucose uptake in the L6E9 rat myotube cell lines. The progressive changes in blood glucose levels in Streptozotocin induced diabetes model with and without Sprotone treatment (100 and 200mg/kgbw) and Metformin as standard drug (350mg/kgbw) over a period of 4 weeks.

Functional food: *Sprotone*

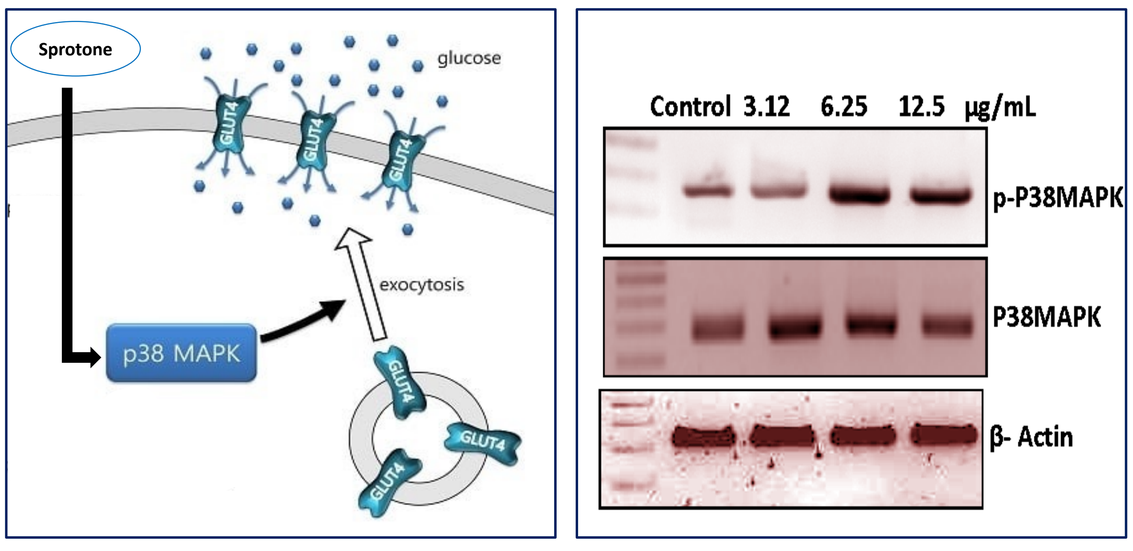
Sprotone-Protective Effects in Acute Pancreatitis

Impaired metabolism and cytotoxic ($[Ca^{2+}]_i$) overload in pancreatic acinar cells are the central events of Acute pancreatitis regardless of the causative factor.



Sprotone pre-treatment protects against the POA induced Calcium overload. Sprotone attenuates the POA induced ATP depletion. IC_{50} values for POA caused ATP depletion with and without Sprotone. (**p=00.79,*$p <$ 0.05, as assessed using Mann–Whitney U test) Results are the mean ±SEM of four experiments.

Anti-diabetic and insulin mimetic effects of Sprotone



Graphical abstract of Sprotone activating the downstream signaling pathway in insulin-sensitive L6E9 rat myotubes. Representative immunoblot showing Sprotone-induced phosphorylation of p38 MAPK kinase,β-actin/pan-p38MAPK were loading controls.

Conclusion

Sprotone exhibits anti-diabetic, insulin-mimetic properties and protects against the POA induced calcium overload and ATP depletion in pancreatic acinar cells.

Sprotone, a functional food manufactured from sprouted cereals and pulses could be the solution for the ever-increasing numbers of Diabetes and Acute Pancreatitis.

Future steps include isolating the active ingredients from Sprotone, evaluating its efficacy and *in vivo* studies on caeruelin induced acute pancreatitis models.