

P85: Morphofunctional characterization of the ileum in a type 1 diabetes rat model 7

Vanessa Mendes-Henriques^{1,2}, Salomé Gonçalves-Monteiro^{1,2}, Filipa Quintela Vieira^{3,4}, Paulo Correia-de-Sá², Margarida Duarte-Araújo²

¹School of Allied Health Technologies, Polytechnic Institute of Porto, Portugal

²Laboratório de Farmacologia e Neurobiologia, Centro de Investigação Farmacológica e Inovação Medicamentosa (MedInUP), Instituto de Ciências Biomédicas de Abel Salazar, Universidade do Porto (ICBAS-UP), Portugal

³Research Centre on Health and Environment (CISA), School of Allied Health Technologies (ESTSP), Polytechnic Institute of Porto, Portugal

⁴Cancer Biology and Epigenetics Group – Research Center, Portuguese Oncology Institute – Porto, Portugal

Presenting author: vannessmhenriques@gmail.com

Introduction: Diabetes mellitus (DM) is a metabolic disorder that affects 1 in 12 people with high mortality and morbidity.

Objective: Knowing that about 76% of diabetic patients have gastrointestinal complications, we decided to characterize morphologically and functionally the ileum of a rat (*Rattus norvegicus*, Wistar) model that mimics type 1 DM.

Material and Methods: Diabetes was chemically induced by a single intraperitoneal injection of streptozotocin (STZ, 55mg/kg). All animals were used 14 days after injection with saline (CTRL-group) or STZ (STZ-group).

Results and Discussion: Macroscopic characterization of the gastrointestinal tract of STZ-animals reveled an increase in caecum's dimensions and in the ileum's weight. Histological examination showed increases in the length of villi (CTRL= 335.84 ± 9.48µm *vs.* STZ= 596.96 ± 11.22µm, *n*=4), thickening of the muscle layer (CTRL= 66.44±0.72µm *vs.* STZ= 100.92±0.57µm, *n*=4), and a decrease in the number of myenteric neurons per ganglia (CTRL= 13.85±0.42 *vs.* STZ= 11.11±0.98, *n*=4).

In vivo functional characterization of STZ (41.09±2.01%, *n*=9) demonstrated that gastrointestinal motility is significantly delayed compared to CTRL-animals (57.41±1.16%, *n*=7). Preliminary data indicates that the spontaneous ileal activity in STZ-animals is more irregular, less frequent and of greater amplitude allowing us to speculate about changes in the activity of pacemaker interstitial cells of Cajal over myogenic or neuronal components. Histoenzymatic data indicate that the extracellular catabolism of ATP and its metabolites are increased in STZ-animals, but the sensitivity of E-NTPDase 2, 3 and E-5'-NTDase to inhibitors was roughly maintained.

Conclusion: In summary, data suggest that STZ-injected rats possess a number of morphological and functional characteristics present in the ileum of type 1 DM patients, rendering this model suitable for testing novel therapeutic targets for the treatment of gastrointestinal complications of diabetes.

Acknowledgments: Work supported by FCT (PEst-OE/SAU/UI0215/2014).

References

1. Yarandi & Srinivasan (2014) *Neurogastroenterol Motil*, 26,611-624;
2. Sik-Park K. (2013) *Neurogastroenterol Motil* 19,121-123.