INTRODUCTION
Proton pump inhibitors increase gastric pH to ensure healing of duodenal and gastric ulcers. However, this increased pH is also the optimal pH for salivary (S-AM) and pancreatic amylase (P-AM) activity in gastric juice. Could a high amylase level in gastric juice explain dyspepsia in patients who fail to respond to standard PPI treatment?

METHOD

Patients

2 groups of patients were included in the study: patients taking PPIs and those not on PPIs (control patients). Gastric juice samples were collected from patients undergoing a gastroscopy.

Reflotron

The Reflotron was used to measure gastric amylase activity in U/L.

RESULTS

Study Population

PPI patients

P-AM and AMYL show significantly higher activity in PPI patients when compared to control patients (p-values <0.05). Amylase activity showed increased results when the patients’ pH was above 6.

Control patients

A significant number of patients treated with PPIs, irrespective of the treatment duration, show Reduced Acid Hyper Secretion (RAHS) on therapy withdrawal. The increased acid output could be a possible reason for the acid-related symptoms and the decreased amylase activity in the sub-group that previously made use of PPIs.

CONCLUSION

Patients who remain symptomatic despite treatment should be questioned regarding compliance, and checked to exclude sub-optimal dosage and inappropriate dose timing. When these are ruled out, alternative therapies, such as tricylic antidepressants, baclofen and acupuncture, should be considered.

AIMS

• To quantify total (AMYL) and pancreatic active amylase present in gastric juice samples
• To correlate any relevant patient and drug history with the gastric amylase activity

SETTING

Endoscopy Unit at Mater Dei Hospital, Malta

Quantitative Analysis

A calibration curve was prepared to confirm the maximum α-amylase activity that the Reflotron could measure in artificial gastric juice, without dilutions. Concentrated samples were diluted with buffered gastric juice to obtain a reading.

Patients diagnosed with GORD or hiatus hernia had the highest activity of S-AM. With the “oesophago-salivary reflex”, a greater volume of saliva is produced, to neutralize or decrease the corrosive effect of the gastric acid on the oesophageal mucosa. Thus, an increase in salivary volume results in a parallel increase in S-AM. Patients diagnosed with gastritis and duodenitis had the highest activity of P-AM. Duodenogastric reflux (DGR) contents include bile, pancreatic and intestinal secretions—thus the increased injury might not be a direct result of P-AM on the gastric and duodenal mucosa. Measuring the amount of gastric P-AM of patients taking PPIs, can provide an indirect measurement of the extent of DGR.

Figure 3: Pie Chart showing the diagnosis of study population (n=100)

Table 1 — Summary of method of analysis for gastric α-amylase

References

2. Roca M. D. Generalisation of omeprazole in gastric juice (PhD Project). Malta: Department of Pharmacy, University of Malta; 2012.
5. Wittkows M, Borens J. Random review is a pronounced acid inhibition also? Aliment Pharmacol Ther 2001; 14: 15 – 22.