

INTRA GASTRIC pH

Pages with reference to book, From 1 To 2

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Role of gastric acid hypersecretion in peptic ulcer disease is an established phenomenon.¹ Prolonged measurements of gastric acidity are of interest because they (a) measure the physiologic pattern of acidity, (b) may provide new insights into pathologic changes of acidity in the course of peptic ulcer disease, and (c) are suited for the evaluation of gastric antisecretory drugs². In most long term studies, gastric contents are usually aspirated through a nasogastric tube and the pH of sample is measured in vitro using a suitably calibrated glass electrode. Aspiration tests, however, have some shortcomings. The procedure of aspiration affects the measurements directly, by the removal of gastric juice, or indirectly by stimulation of duodenogastric reflux or provocation of secretory responses.³ The presence of solid meals in the stomach poses problems for aspiration, repeated sampling procedures are inconvenient and uncomfortable for the subjects and nocturnal sampling, especially during pharmacologic acid inhibition, is often impossible because of low intragastric volumes⁴. Gastric pH measurements with a pH electrode placed in the most dependent part of the stomach will show fluctuations not seen in the aspirated sample. The first study of in situ pH in the gastrointestinal tract was performed by McClendon using a hydrogen electrode but the electrode was too thick to be used and furthermore introduction of hydrogen in the gastrointestinal lumen changed the composition of the contents. The glass electrode was first employed by Eyerly and later by Rovelstad. These first pH recordings confirmed that pH changed frequently and rapidly. The main causes for the wide fluctuations were intermittent emptying of acid contents³. Many difficulties associated with in situ pH measurements in the gastro-intestinal tract disappeared with the development of the glass electrode. Recently pH has been measured continuously in vivo by intra gastric electrode⁵. Continuous recording from a pH electrode gives a more detailed profile of gastric acidity than the sampling technique². pH measurements represents the negative logarithm of hydrogen ion activity and relate closely, but not exactly, to hydrogen ion concentration. Serial measurements of intra gastric pH are suitable for recording the effect of diet or drugs on gastric acidity in ulcer patients⁶⁻⁸. The major advantage of this technique is that data can be collected over a reasonably long period in subjects given a standard meal. The effect of meal, Coca Cola, smoking and Cimetidine on duodenal pH was determined in controls and patients with duodenal ulcer using intra luminal pH recording for five hours. After a meal, mean pH increased significantly in both controls and patients. Coca Cola significantly increased the periods of duodenal acidification and reduced alkalization in both groups, whereas Cimetidine increased the periods of duodenal alkalization to more than normal levels⁹ - Twenty four hours gastric pH monitoring was done in healthy subjects. During this period, gastric pH rarely rose above a value of 2. Transient elevations of pH were observed after each meal intake and in some subjects at night time². Post prandial fluctuation of pH probably reflects the heterogeneity of gastric juice composition after a meal¹⁰ whereas the nocturnal episodes of alkalization may be due to duodenal gastric reflux. Acidity reached its highest level in the late evening, followed by a gradual decline in the second half of the night, and a rise before breakfast.² The reason for the decline of acidity during the second half of the night is unknown, and has been assumed that a decrease of vagal activity with a subsequent decrease of secretion might be responsible.¹¹ Spices, especially red chili powder is commonly consumed in many food preparations in this part of the world. Studies demonstrate their effect on human gastric mucosa and suspect they play a role in the etiology of gastritis and peptic ulcer.¹² As role of spices on gastric pH is not well defined, an attempt was made to find the effect of a Pakistani spicy meal on gastric pH

and to see whether any differences exist between a typical Western type of diet and Pakistani spicy diet, on intragastric pH. Ulcer patients diagnosed on upper gastrointestinal endoscopy and controls with negative endoscopy were studied. Patients were classified into two groups on the basis of food intake. One group was given Pakistani spicy food and the other a standard western type of food. After an overnight fast and intubation with electrode assembly positioned in the most dependent part of the stomach, pH was monitored for one hour in the basal state and then for another three hours after the meal. No significant difference in pH was noted in both groups. pH Was low in the basal state, followed by an increase after the meal. However the rise due to the buffering effect of the meal did not last long and a gradual return to the basal state pH was observed shortly. It was, therefore, concluded that spicy cooked food does not have a significant and prolonged effect on the lowering of the intragastric pH.

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