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Abstract

Objective: The aim of this study was to test a new mathematical model of the electrolyte concentrations in basal gastric secretion and to demonstrate whether this model was better than the old formula. Previous evidence suggests that primary gastric acid secretion has an electrolyte composition of $[H^+]$ 145, $[Na^+]$ 7, $[K^+]$ 17 and $[Cl^-]$ 170 mmol/l, and that this can be modified by an extragastric component consisting of duodenogastric reflux and swallowed saliva. The only quantitative measurement available to date ignores the swallowed saliva.

Method: Under basal conditions, gastric juice was aspirated and simultaneous sampling of saliva was performed in 60 adult subjects (33 men, 27 women), aged 23-85. Na^+ , K^+ , Cl^- , phenol red (marker for pyloric loss) and titratable acidity or alkalinity were measured in aspirated gastric juice, and epidermal growth factor (EGF) was measured in saliva and gastric juice. Estimates of the primary gastric acid secretion were made by two methods: (1) V(G) formula which corrects for the duodenogastric reflux and assumes that there is no swallowed saliva: and (2) V(acid) formula, a novel procedure intended to correct for swallowed saliva as well and based on the known concentrations of electrolytes in saliva secreted at varying rates.

Results: The mean EGF concentrations were 3.42 ng/ml in saliva, 3.40 ng/ml in gastric juice. From the relationship of EGF output versus calculated primary acid secretion, the concentration of EGF in the extragastric component could be calculated. The V(G) formula gave a zero value of EGF whilst with V(acid), the calculated concentration of salivary EGF was 3.73 ng/ml and showed close correspondence with the measured EGF concentration in spat saliva.

Conclusion: It is concluded that the new formula is more accurate, and gives a reasonable measurement for the volume of saliva in aspirated gastric juice.

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