Gastric Acid Measurements in Peritoneal Dialysis

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The potential effect of peritoneal dialysis on gastric secretion of acid was studied in patients undergoing chronic intermittent peritoneal dialysis. Sixteen measurements were carried out in 9 patients with the endoradioprobe method using the 'Heidelberg capsule' (Nöller, 1962). The small encapsulated telemetry transmitter was swallowed when the peritoneal cavity was empty and the signals of gastric pH values transmitted by the capsule were recorded continuously by the electrical apparatus (Telefunken-AEG, Hgs Type RF 6). This method was chosen to avoid the distress patients feel with stomach intubation, and because it gives results as good as those obtained by gastric aspiration (Connell & Waters, 1964). Peritoneal dialysis was performed according to the conventional method using two litre exchanges and isotonic and hypertonic solutions. The measurements were recorded before the inflow of the dialysis fluids, and while the peritoneal dialysis solutions remained in the peritoneal cavity for 30 minutes. It has been postulated that uraemic subjects have little or no hydrochloric acid in their gastric juice because increased formation of ammonia neutralises gastric acidity (Lieber & Lefevre, 1959). Fitzgerald and Murphy (1950) showed that the higher the level of blood urea, the more ammonia is produced. Thus, one might expect a relationship between the level of blood urea and gastric acidity. The results are shown in Figure 1. As can be seen, baseline measurements varied and correlation between gastric pH and the level of blood urea was not found. Regardless of the osmotic pressure of the peritoneal solutions there was a uniform fall of gastric pH in all cases during peritoneal dialysis. Using isotonic solutions the mean pH fall was 0.65. With hypertonic solutions (3.5 g/100 ml dextrose) reduction was considerable (mean value 2.0) and, in two experiments with hypertonic solutions (7 g/100 ml) of dextrose) the values were 2.7 and 3.5 respectively. In spite of the fall in gastric pH, in no case did gastric pH reach normal values. These findings may explain some complaints patients make with reference
to the gastrointestinal tract during peritoneal dialysis. This fall of gastric pH might also be dependent upon the osmotic effect of the peritoneal dialysis solutions.

REFERENCES

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