ABSTRACT

The present investigation aimed to explore the change in gastric mucosal barrier to ionic movements before, during and after bleeding with and without the presence of bile reflux.

Rat gastric pouch was instilled with a known volume and concentration of $H^+$, $Cl^-$ and $Na^+$ (2.6 ml, 25, 75 and 50 mEq/L, respectively). After a period of steady secretion the rat was bled (15 ml/kg B.W.) and later reinfused with the removed blood. During the period of hypovolemic shock, gastric volume and HCl secretion decreased, this was probably due to energy deficit while the change in Na$^+$ concentration increased due to the reduction of gastric volume gain when compared to the prebleeding control values. The net Na$^+$ movement from blood to lumen was reduced perhaps because of the decrease in Na$^+$ concentration gradient between the plasma and the lumen. The gastric diffusion coefficient for Na$^+$ did not change during hemorrhage. Since normal gastric mucosa is very impermeable to Na$^+$ and H$^+$-ion, particularly more impermeable to H$^+$ than Na$^+$-ion, therefore, it is unlikely that the decrease in H$^+$ gain during hemorrhage was due to the increase of back diffusion of H$^+$. 0.25 ml of bile collected from bile duct when introduced into the lumen without bleeding the rats, enhanced the net movement of Na$^+$ from blood into the lumen, i.e., 26.94±2.38 to 43.31±4.94 μEq/g stomach/30 min (P< 0.05), while the HCl secretion remained normal, indicating higher permeability of mucosa barrier to Na$^+$ in the presence of bile. With bile and hemorrhagic shock, net H$^+$ gain appears to be negative (-7.27±1.75 μEq/g stomach/30 min) when compared to the control rats (47.34±8.37 μEq/g stomach/30 min) and net Na$^+$ gain increased from 15.55±4.15 of control rats to 29.29±4.39 μEq/g stomach/30 min suggesting
that mucosal barrier is weaken during the period of shock and addition of bile could disrupt the mucosa to allow the leak of Na⁺ and back diffusion of H⁺. The diffusion coefficient of Na⁺ movement across the mucosa during bile administration or hemorrhage plus bile administration indicated the increase in mucosal permeability to Na⁺.
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