

Physiology and function

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Physiology and Function Physiology and Function Cholecystokinin

Cholecystokinin or CCK is a hormone secreted from duodenum in response to presence of fatty foods in the duodenal lumen. CCK plays a role in stimulating the parietal cells in the gastric mucosa to secrete more acid. But most important function of CCK is contraction of Gall bladder and relaxation of sphincter of Oddi. When food rich in fat reach the duodenum, CCK cause expulsion of bile in the common bile duct and relaxed sphincter of Oddi allow easy passage into the duodenum to mix with the food. This mixing allows emulsification of fat and facilitate in its digestion (Guyton & Hall, 2000).

Peristalsis

Peristalsis is the rhythmic segmental contraction and relaxation of the GI tract that helps in propulsion of food. Peristalsis is generally under autonomic control and is further mediated by myentric plexus located between the circular and longitudinal muscle layer. Contraction of these two muscles produces peristaltic waves, normally in a forward direction. Peristalsis plays a different role depending on the location of the GI tract. In the esophagus, it simply propels the food into the stomach. But in stomach, strong peristaltic contractions grind the food and mix it well with the acidic contents of the stomach. In the intestines the peristalsis is slow, providing sufficient time for digestion and absorption to take place (Guyton & Hall, 2000).

Bile

Bile is produced and secreted by liver but is transported to gall bladder for storage. In the gall bladder it becomes concentrated and is released into the duodenum via common bile duct under the influence of cholecystokinin and vagal stimulation. Bile is composed of water, bile salts, bilirubin, cholesterol, fatty acids, lecithin and other common ions. Bile serves two important

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functions: assistance in fat digestions and removal of waste products. Bile does not contain any enzymes for digestion of fat but it causes emulsification of fat particles facilitating digestion and absorption in the intestinal mucosa. Bilirubin, a waste product of hemoglobin breakdown is also secreted in the feces via bile (Guyton & Hall, 2000).

Saliva

Saliva is secreted in the oral cavity by various glands such as parotid, submandibular, and sublingual glands. Every day these glands produce 800-1500ml of saliva. Saliva has two important components: ptyalin and mucus. Ptyalin is an amylase enzyme that helps in starch digestion, whereas mucus plays an important role in lubricating the food bolus and reducing mechanical friction. Saliva also has one important function of protecting oral cavity from invading pathogens. It is a well known fact that many pathogens such as invading bacteria resides in mouth but still they are not able to ulcerate or infect the oral tissues. Many immunological ingredients of saliva keep these pathogens under check and prevent tissue destruction (Guyton & Hall, 2000).

Villi

The epithelial lining of intestinal mucosa is thrown into finger like projections called villi. These villi are present on mucosal folds called valvulae conniventes or folds of Kerckring. There are literally millions of villi studded on the entire length of small intestine and they provide enormous surface area for absorption of the digested food substances. Moreover, each epithelial cell lining the villi has a brush border surface with even tiny projections called microvilli. Brush border enzymes secreted from these structures are responsible for end stage digestion, breakdown of

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disaccharides into monosaccharide. These villi are also supplied with abundant blood vessels to carry the absorbed substances from the intestine to the liver (Guyton & Hall, 2000).

References

Guyton, A. C., & Hall, J. E. (2000). Textbook of medical physiology. Philadelphia: Saunders.