

Lecture no.10

ATRIAL NATRIURETIC PEPTIDE

- The Atrial Natriuretic Peptide (ANP) is synthesised and stored in the atrial muscles as 126 amino acid proANP which is cleaved to become 28-amino acid active hormone.
- Secretion of ANP is stimulated by increase in atrial pressure caused either by pressor agents or by increase in atrial volume.
- On kidney, ANP produces natriuretic and diuretic effects, increases GFR, renal excretion of water, Na, Ca, Cl, Mg and phosphate.
- The ANP blocks the secretion of vasopressin from neurohypophysis and angiotensin II or ACTH stimulated release of aldosterone from adrenal cortex.
- ANP causes decrease in blood pressure. It inhibits renin secretion.

GI HORMONES

1. **By size GIT is the largest endocrine organ**, No defined endocrine glands
2. Diffuse distribution of entero-endocrine cells through out GIT
 - a. Endocrine cells decrease progressively towards the colon
 - b. Enterochromaffin cells contain 5-OH tryptophan (Serotonin)
 - c. GI hormones show both endocrine and paracrine activities
3. No feed back regulation for these hormones
4. Presence of food or GIT environment stimulates their secretion, Removal of the stimulus stops secretion
5. There are several polypeptide substances synthesized and secreted by cells of GI tract.

6. These include gastrin, secretin, cholecystokinin (CCK) or (pancreozymin), gastric inhibitory peptide(GIP), motilin, vasoactive intestinal polypeptide (VIP), somatostatin, bombesin and substance P.
7. Some of these hormones act as paracrine hormones; others enter circulation and act as general hormones.
8. Many of these hormones are also found in the nervous system.
9. Based on structural and functional similarity, GI tract hormones are grouped into two families
 - a. Gastrin family – gastrin, CCK
 - b. Secretin family – secretin, glucagon, glycentin, VIP, GIP

Hormone	Site of production	Stimulus for release	Action
Gastrin	Distal stomach G cells	Protein in stomach, high gastric pH, vagal stimulus	Stimulates HCl, Pepsinogen secretions, gastric motility, growth of stomach epithelium
Secretin	Duodenum S cells	Acid in duodenum	Stimulates NaHCO ₃ secretion of bile and pancreas, inhibits GI motility and gastric secretions
CCK	Duodenum to Ileum. Also found in brain; CCK 8, 16 & 32.	Protein and fat in small intestine	Stimulates enzyme secretions of pancreas and gall bladder contraction, inhibits gastric emptying
GIP	Duodenum and upper jejunum	Carbohydrates and fat in small intestine	Stimulates pancreatic insulin secretion, inhibits gastric motility and secretion
Motilin	Duodenum and jejunum K cells	Acetylcholine	Regulates gastric motility between meals, tone of lower esophageal sphincter

VIP	Ileum, also found in nerves, brain, ANS	Stimulates intestinal motility, inhibits gastric acid secretion	
Somatostatin	Stomach D cells	Increased level of glucose, amino acids, catecholamines and glucagons	Inhibits pancreatic insulin, glucagons and gastric secretion, gastric motility and gall bladder contraction
Substance P	GI tract	Stimulates intestinal motility	