INFECTIONS OF THE DIGESTIVE SYSTEM

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Introduction

- A garden of unsurpassed variety and complexity in health or disease

- Normal stomach is an effective sterilization chamber, limiting entry of microbes to s/intestines and beyond → provision of nonspecific protection Vs many enteric pathogens

- Normal GIT flora goes up to 400+ distinct spp of bacteria, fungi, and protozoa, living in a symbiotic relationship with the host:

From host

- The host provides room while the bacteria helps the host in various ways:

1. Conversion of unabsorbable glucose to absorbable organic acids
2. Supply of essential vitamin K
3. Reabsorption and conservation of estrogens and androgens excreted in bile
4. Resistance to colonization by invading pathogens

INFECTIONS

Vary from Most prevalent (dental caries) to fairly common (diarrheas and food poisoning)

And may cause unusual opportunistic infections of the immune compromised pts

- diarrheal diseases are the far greatest manifestation of infection.
- Infections of this system range in severity from:

>> asymptomatic or silent (polio) to mild (diarrhea), to life-threatening loss of fluid and electrolytes (cholera) and severe mucosal ulceration (bacillary dysentery)

MODES OF MICROBIAL ENTRY

- Fecal-oral route
- Contaminated food, water or by vectors

POSSIBLE DAMAGE DUE TO COLONISATION OF GIT

Several signs and symptoms are indicative of GIT related infections:

1) Pharmacological Action

* Some bacterial toxins alter normal intestinal function without causing lasting damage to target cells → enterotoxins of *V. cholerae* or some *E.coli* which provoke copious watery diarrhea

reduces absorptive capacity of s/intestines, sending more fluid to colony - overwhelming it, resulting in "overflow" diarrhea, leading to dehydration and loss of electrolytes

2. Local Inflammation

* May result as a consequence of microbial invasion

* Often local invasion spreads to contiguous tissue and beyond

* The mouth is often affected, usually in the gums from normal gingival flora (periodontitis)

* In the intestines, infections can cause inflammation may result in dysentery

3. Deep Tissue Invasion

- Certain organisms are able to spread to adjacent tissues and to enter the blood stream or lymph

worm ---- strongyloides

protozoa --- entamoeba

bacterium --- salmonella

4. Perforation

- Injury to mucosal epithelia may result in spillage of normal flora into sterile areas, often with serious consequences:
  * rapture of appendix may lead to peritonitis
  * perforation of esophagus may lead to mediastinitis.

DISEASES OF THE PRINCIPLE SITES OF THE GIT

1. MOUTH

• Main microbial port of entry as it is constant interaction with food, fluid and fingers.

- Specific defenses of the mouth include:

* nonpathogenic resident flora (resist by space and metabolic inhibitors)

* mechanical action of saliva and tongue

* enzymes and secretions (lysozyme and IgA)

H. Pylori causing oral sores by migration affecting gums.

2. STOMACH

- Mostly sterile with <1000 bacteria/ml
- Predominantly Gram + (Strep; Staph; and Lactobacilli)
- *Helicobacter pylori* often associated with and maybe involved in production of gastritis and peptic ulcers

3. SMALL INTESTINES

- Mostly diarrheal pathogens
- Rotavirus, Toxigenic bacteria (*V. cholera; E.coli*), Protozoa (giardia; cryptosporidium), Bacteria of food poisoning (*S. aureus; B. cereus*), Other (*C. jejuni; Y. enterocolitica)*

4. LARGE INTESTINES

- Here infections result from:- Mucosal inflammation, Epithelial damage leading to Dysentery

- Most important organisms are:-

  >> Shigella; Salmonella; Campylobacter; *Yersinia; E. coli*

- Diarrhea of the large intestines is often characterized by presence blood, mucus and pus,
- *Consequences* include rectal prolapse, toxic megacolon.

DIARRHOEA AND DYSENTERY

- Diarrhea is a final common pathway of intestinal responses to many inciting agents
- Can be caused by some infections but also occur via noninfectious conditions.
- It is an increase in the daily amount of watery stool (with associated frequency)
- It may manifest in different forms

DIARRHEA AND DYSENTERY……

- It could be considered an adaptive mechanism, dev by the body to rid itself of harmful material **OR** by microorganisms to ensure their transfer from one host to another!
- There is a teleological analogy with vomiting, which is used to rid the stomach of noxious material while dysentery is a more circumscribed term used for inflammatory disorders, mainly of the colony, ordinarily not accompanied by large increases in stool volume

TREATMENT

1. most acute diarrheas are mild and self limiting
2. oral fluid replacement is often best remedy

- ORT is of most importance – accelerates absorption of Na and restores normal osmolality

To 1 liter of boiled cooled water, add:

- 1/2 teaspoon salt (3g)
- 1/4 teaspoon bicarbonate (1.5g)
- 1/4 teaspoon KCL (1.5g)
- tablespoons sugar (20g)

3. intervention with specific antimicrobials often dependent on severity and duration (*E.coli; V.cholera* and shigella).

THE END