

## **Bowel infections -Viruses**

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### **Bowel infections**

**Bowel infection** is an illness caused by pathogens in the digestive tract.

#### **Main symptoms**

- Diarrhoea caused by different agents; Bacteria and viruses,
- Symptoms do not vary much between bacterial and viral **infections**

**Acute viral gastroenteritis.** e.g. Infantile gastroenteritis:

- Acute onset, the presence of fever, lack of any relevant past medical history
- Viruses are more frequent causes than bacterial pathogens
- Global importance of acute viral gastroenteritis:
- Worldwide especially in infants & young children but may occur in adults.
- Major cause of death in developing countries.
- Overwhelming in Asia, Africa & Latin America; 5-10 million die every year.
- Major effect is on nutritional status & growth

#### **Epidemiology**

- Endemic infection is wide spread.
- Epidemics or outbreaks often associated with some viruses.

i.e. Noroviruses

#### **How diagnosis is confirmed?**

- Virus excreted in large quantities,  $10^6$  particles/ml Stool sample should be sent for
- EM- characteristic virus morphology
- ELISA for antigen detection
- Virus isolation not done routinely
- Expensive battery of diagnostic tests are not justified.
- Diagnostic support is important in epidemics & severe infections but best by reference laboratories.

### **What are short term complications of viral gastroenteritis?**

- Excessive fluid loss may lead to dehydration & electrolyte imbalance
- Metabolic acidosis
- How patient is managed – open ward:
- Ward staff must be aware of the significant risk of nosocomial spread of rotavirus infection.
- Adherent to strict hand washing protocols is the single most useful measure to reduce the risk of spread
- Ideally be nursed in a single rooms but not practical or possible.

### **Four major groups of viruses that cause gastroenteritis**

- **1. Rotaviruses** – commonest in young children
- **2. Enteric adenoviruses** (serotypes 40, and 41)
- **3. Astroviruses** – star like morphology, mild , rarely need hospitalization
- **4. Caliciviruses: Noroviruses**  
& small round structured viruses(SRSVs/Norwalk like agents)

### **Other viruses found in human stools but their role is unproven as diarrhea agents**

- Coronaviruses
- Enteroviruses
- Small round viruses

### **Rotavirus**

Transmission – faecal-oral route

Rotavirus significance:

- Commonest single cause of diarrhoeal disease worldwide
  - Estimated annual incidence 125 million cases, 8-900,000 deaths mostly in poor countries
  - No specific treatment
  - 6 months- 2 years common
  - Unusual after 3 yrs
- Severity varies 24hour illness to overwhelming gastroenteritis with occasional deaths
- Vomiting a prominent feature may precede diarrhoea by 48 hours
  - Fever >38.5C almost universal

- Watery diarrhoea persists 5-7 days on average
- Blood or pus in stools suggest concurrent bacterial infections
- Chronic rotavirus infections:

**Patients are at risk of chronic rotavirus infections:**

Immunosuppressed children or adults- may suffer chronic diarrhea >3m duration

**Adenoviruses – 40 & 41**

- Enteric Adenoviruses
- **Classification:** over 40 serotypes
- Grouped into six subgenera A-F
- **Subgenera F** contains **serotypes 40 & 41**
- Mainly in young children
- May or may not be associated with respiratory symptoms
- Gastroenteritis is associated with 40 and 41.
- 40 and 41 are referred as enteric adenoviruses

**Caliciviruses/noroviruses**

Caliciviruses EM → Refer

- Cuplike hollows on their surface
- Cause winter vomiting diarrhoea
- Associated with outbreaks of gastroenteritis
- Affect people of all ages
- Spread by food (shell fish) and water
- Aerosols generated by forceful vomiting
- Cuplike hollows on their surface

## **Noroviruses:**

Norovirus is a single genus of the Caliciviridae family

- Noroviruses are the commonest cause of acute gastrointestinal disease in England and Wales.

- Recognised as the main aetiological agent of outbreaks of infectious intestinal disease (IID).

- Highest frequency in healthcare-associated settings, particularly hospitals and care homes.

## **Astroviruses**

Astroviruses – EM picture

- 28nm, ss RNA viruses, star shaped structure
- 5 serotypes are common, associated with mild childhood diarrhoea.
- Virus can be found in large numbers in faeces more commonly in diarrhoeal patients than normal persons.
- High percentage of seropositives in different age groups.
- Virus observed in ¼ frequency to that of rotavirus.
- Concurrent infections can occur with rotaviruses or caliciviruses. But do not make more ill.
- Difficult to cultivate in vitro except few strains.
- Less pathogenic
- **Epidemic disease in young children in paediatric wards, day care centres, nursery homes.**

Diagnosis is by EM.

## **Nosocomial diarrhoea**

### **Presentation:**

- Cluster of patients with diarrhoea and vomiting.
- Acquired in hospital
  - **with evidence of spread ( viral gastroenteritis)**
  - or a point source ( food borne salmonella)

- **Diagnosis:**
- Clinical presentation
- Culture for conventional bacterial pathogens
- **EM of stools for viruses**
- Toxin detection for C difficile
- Management nosocomial diarrhoea:
- Fluid replacement
- Isolation
- Cohort nursing of symptomatic patients
- With reliable hand washing to prevent spread
- Staff with symptoms should not continue to work

**Travelers' diarrhoea: viruses**

- Rotaviruses
- Noro viruses