

Epidemiology and prevention of enteric fever, STDs, ARI, Diarrhoeal diseases, Helminthic diseases

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Enteric fever

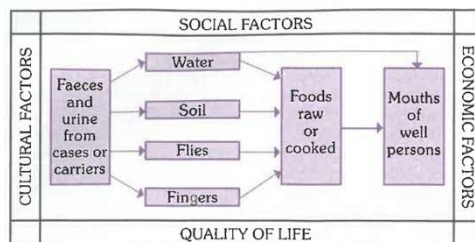
- The term enteric fever includes both **typhoid and paratyphoid fevers**.
- Agent:** *S. typhi* is the major cause of enteric fever. *S. paratyphi* A and *S. paratyphi* B are relatively infrequent.
- Reservoir of infection:** Man is the only known reservoir of infection i.e. cases and carriers. Typhoid Mary was a chronic carrier of typhoid who gave rise to more than 1300 cases.
- Source of infection:** Primary sources are feces and urine of cases and carriers; secondary sources are contaminated water, food, fingers and flies.

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2

Enteric fever

- Incubation period:** Usually 10-14 days
- Modes of transmission:** Fecal-oral route or urine-oral route



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3

Control of enteric fever

- There are three lines of defense against typhoid fever:
 - **Control of reservoir:** Identification, isolation, treatment and disinfection
 - **Control of sanitation:** Protection and purification of drinking water supplies, improvement of basic sanitation, and promotion of food hygiene.
 - **Immunization:** Anti-typhoid vaccine

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4

Sexually transmitted diseases

- **Sexually transmitted infections (STIs):** STIs are a diverse group of infections that are transmitted exclusively or primarily by sexual or intimate personal contact.
- These include infections caused by bacteria, virus, protozoa, spirochete and parasites.

Classification of STD agents

□ Bacteria:

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Treponema pallidum*
- *Hemophilus ducreyi*
- *Mycoplasma hominis*
- *Ureaplasma urealyticum*
- *Calymmatobacterium granulomatus*

□ Virus:

- *Human herpes virus 1,2,5*
- *Hepatitis B virus*
- *Human papilloma virus*
- *Molluscum contagiosum virus*
- *Human immunodeficiency virus*

Classification of STD agents

□ Protozoa

- *Entamoeba histolytica*
- *Giardia lamblia*
- *Trichomonas vaginalis*

□ Fungus

- *Candida albicans*

□ Ectoparasites

- *Phthirus pubis*
- *Sarcoptes scabiei*

Important sexually transmitted diseases

Disease	Agent	Disease	Agent
Gonorrhoea	<i>Neisseria gonorrhoeae</i>	Genital herpes	<i>Herpes simplex virus</i>
Syphilis	<i>Treponema pallidum</i>	Hepatitis	<i>Hepatitis B virus</i>
Chancroid	<i>Hemophilus ducreyi</i>	Genital warts	<i>Human papilloma virus</i>
Lymphogranuloma venerum	<i>Chlamydia trachomatis</i>	AIDS	HIV
Granuloma inguinale	<i>Calymmatobacterium granulomatus</i>	Genital molluscum contagiosum	<i>Molluscum contagiosum</i>
Vaginitis	<i>Trichomonas vaginalis</i>	Vaginitis	<i>Candida albicans</i>

Classification of STD

Type of STD	Examples
Ulcerative STD	Syphilis, chancroid, lymphogranuloma venerum (LGV), genital herpes
Non-ulcerative STD	Gonorrhoea, chlamydia, trichomoniasis
STD not infecting reproductive tract	AIDS, hepatitis B infection

Transmission of STDs

Horizontal transmission

- Unprotected sexual intercourse
- Intravenous drug use
- Physical contact during sexual intercourse
- Through blood and blood product
- Medical procedures and sharps

Vertical transmission

- During pregnancy
- At delivery
- Through breast-feeding

Common symptoms of STDs

In women:

- Dysuria, frequency/burning micturition
- Dyspareunia
- Vaginal discharge
- Vaginal itching
- Genital ulceration
- Lower abdominal pain
- Lymphadenopathy

In men:

- Dysuria, frequency/burning micturition
- Urethral discharge
- Genital ulceration
- Skin rash
- Erectile dysfunction
- Acute scrotal pain
- Lymphadenopathy

Biological consequences of STDs

In women:

- Infertility
- Chronic abdominal pain
- Ectopic pregnancy
- Cervical cancer
- Preterm delivery
- Spontaneous abortion

- Intrauterine death of fetus
- Increased risk for acquisition of HIV infection
- Neurosyphilis

Biological consequences of STDs

□ In men:

- Urethral stricture
- Infertility
- Increased risk for acquisition of HIV infection
- Neurosyphilis

□ In newborn

- Congenital malformation
- Potentially blinding eye infections or pneumonia
- Perinatal deaths including stillbirth
- Increased risk for acquisition of HIV infection

Principles of management of STDs

- Management of STDs is based on few principles:

1. **Cure of acute infection** both symptomatic and asymptomatic
2. **Prevention of long-term consequence** of STDs
3. **Prevention of transmission of infection** to sex partner and to the fetus in case of pregnancy
4. **Presumption of acquisition** and transmission of HIV
5. **Promotion of treatment adherence** or compliance
6. **Changes in treatment regimen** based upon periodic antimicrobial resistance assessment

WHO case definition of AIDS surveillance

- An adult or adolescent is considered to have AIDS if at least 2 of the following major signs are present with at least 1 minor sign.

□ Major signs:

- Weight loss 10% of body weight
- Chronic diarrhoea for more than 1 month
- Prolonged fever for more than 1 month

□ Minor signs:

- Persistent cough for more than 1 month
- Generalized pruritic dermatitis
- History of herpes zoster
- Oropharyngeal candidiasis
- Chronic progressive herpes simplex infection
- Generalized lymphadenopathy

Expanded WHO case definition of AIDS surveillance

- An adult or adolescent is considered to have AIDS if a test for **HIV antibody gives a positive** result and one or more of the following conditions are present:
 - 10% of body weight loss, with diarrhoea or fever or both, intermittent or constant, for at least 1 month
 - Cryptococcal meningitis
 - Pulmonary or extra-pulmonary tuberculosis
 - Kaposi sarcoma
 - Neurological impairment
 - Oropharyngeal candidiasis
 - Clinically diagnosed life-threatening or recurrent pneumonia
 - Invasive cervical carcinoma

Control of AIDS

- There are **4 basic approaches** to control of AIDS:
 - **Prevention:** education, combination prevention programme, prevention of blood-borne HIV transmission
 - **Antiretroviral treatment**
 - **Specific prophylaxis**
 - **Primary health care**

Acute respiratory infections

- **Acute respiratory infections (ARI)** may cause inflammation of the respiratory tract anywhere from nose to alveoli, with a wide range of combination of symptoms and signs.
- ARI is classified depending on the site of infection:
 1. **Upper respiratory tract infections:** Include common cold, pharyngitis and otitis media.
 2. **Lower respiratory tract infections:** Include epiglottitis, laryngitis, laryngotracheitis, bronchitis, bronchiolitis and pneumonia.
- **Clinical features** include running nose, cough, sore throat, difficult breathing, ear problem, fever.

Agents causing ARI

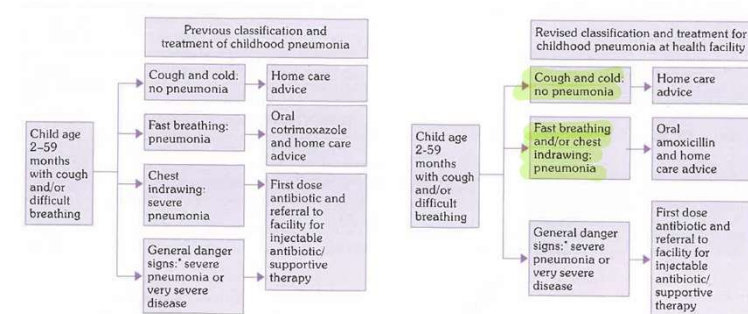
❑ Bacteria:

- *Bordetella pertussis*
- *Corynebacterium diphtheriae*
- *Hemophilus influenzae*
- *Klebsiella pneumoniae*
- *Legionella pneumophila*
- *Streptococcus pneumoniae*
- *Streptococcus pyogenes*
- *Mycoplasma pneumoniae*

❑ Virus

- Adenovirus
- Enterovirus
- Influenza virus
- Measles
- Rhino virus
- Respiratory syncytial virus
- Corona virus

Treatment of childhood pneumonia



Diarrhoeal diseases

- Diarrhoea is defined as the passage of loose, liquid or watery stools. These liquid stools are usually passed more than here times a day.
- Clinical types of diarrhoeal diseases:
 - Acute watery diarrhoea:** lasts several hours to days
 - Acute bloody diarrhoea:** also called dysentery
 - Persistent diarrhoea:** lasts 14 days or longer
 - Diarrhoea with severe malnutrition**

Infections causing diarrhoea

□ Bacteria:

- | | |
|---------------------------|---------------------------|
| ▪ Campylobacter jejuni | ▪ Staphylococcus aureus |
| ▪ Escherichia coli | ▪ Clostridium perfringens |
| ▪ Shigella | ▪ Clostridium difficile |
| ▪ Salmonella | ▪ Aeromonas |
| ▪ Vibrio cholerae | ▪ Yersinia enterocolitica |
| ▪ Vibrio parahaemolyticus | ▪ Chlamydia |
| ▪ Bacillus cereus | ▪ Neisseria gonorrhoeae |

Infections causing diarrhoea

□ Viruses:

- Rotaviruses
- Astroviruses
- Adenoviruses
- Caliciviruses
- Coronaviruses
- Norwalk group viruses
- Enteroviruses
- cytomegalovirus

□ Others:

- Entamoeba histolytica
- Giardia intestinalis
- Trichuriasis
- Cryptosporidium SPP
- Intestinal worms
- Cyclospora

Diarrhoeal diseases control programme

- Intervention measures recommended by WHO are:

□ Short-term measures:

- ✓ Appropriate clinical management

□ Long-term measures:

- ✓ Better MCH care practices
- ✓ Preventive strategies
- ✓ Preventing diarrhoeal epidemics

Appropriate clinical management

- Oral rehydration therapy
- Intravenous rehydration
- Maintenance therapy
- Appropriate feeding
- Chemotherapy
- Zinc supplementation

Better MCH care practices

- **Maternal nutrition:** Prenatal and postnatal nutrition
- **Child nutrition:**
 - Promotion of breastfeeding
 - Appropriate weaning practices
 - Supplementary feeding
- **Vitamin A supplementation**

Preventive strategies

- **Sanitation**
 - Measure to improve water supply
 - Measure to improve excreta disposal
 - Measure to improve domestic and food hygiene
- **Health education**
 - To promote breastfeeding, clean drinking water and personal hygiene
- **Immunization**
 - Rotaviral vaccine

Soil-transmitted helminthiasis

- Soil-transmitted helminthiasis (STH) refers to a group of parasitic diseases in humans caused by intestinal-
 - **Roundworms (*Ascaris lumbricoides*)**
 - **Hookworms (*Necator americanus* and *Ankylostoma duodenale*)**
 - **Whipworms (*Trichuris trichiura*)**
- Soil-transmitted helminth (STH) infections are among the most common infections worldwide with an estimated **1.5 billion infected people or 24% of the world's population.**

Transmission of STH

- Soil-transmitted helminths are transmitted by **eggs that are passed in the faeces of infected people**. Adult worms live in the intestine where they produce thousands of eggs each day. In areas that lack adequate sanitation, these eggs contaminate the soil. This can happen in several ways:
 - eggs that are attached to vegetables are ingested when the **vegetables are not carefully cooked, washed or peeled**;
 - eggs are ingested from **contaminated water sources**; and
 - eggs are ingested by children who play in the contaminated soil and then **put their hands in their mouths** without washing them.

Nutritional effects of STH

- Soil-transmitted helminths impair the nutritional status of the people they infect in multiple ways.
 - The worms feed on host tissues, including blood, which leads to a **loss of iron and protein**.
 - Hookworms in addition cause chronic intestinal blood loss that can **result in anaemia** especially in adolescent girls and women of reproductive age.
 - The worms increase **malabsorption of nutrients**.
 - Some soil-transmitted helminths also cause **loss of appetite** and, therefore, a reduction of nutritional intake and physical fitness.

Prevention and control of STH

- **Primary prevention:**
 - Sanitary disposal of human excreta
 - Provision of safe drinking water
 - Food hygiene habits
 - Health education of the community people
- **Secondary prevention:**
 - WHO recommended medicines – albendazole (400 mg) and mebendazole (500 mg) – are effective
- **Treatment of anaemia and other complications**
- **Preventive chemotherapy**

Preventive chemotherapy or deworming

- WHO recommends periodic medicinal treatment (deworming or preventive chemotherapy) without previous individual diagnosis to all at-risk people living in endemic areas. People at risk are:
 - **preschool children;**
 - **school-age children;**
 - **women of reproductive age (including pregnant women in the second and third trimesters and breastfeeding women); and**
 - **adults in certain high-risk occupations such as tea-pickers or miners.**

References

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