

INFECTIOUS DISEASES

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INFECTIOUS DISEASES

are disorders in which tissue damage or dysfunction is produced by a microorganism.

Changing pattern of infectious diseases

Vaccines have controled or eliminated:

smallpox, measles, pertussis, poliomyelitis, mumps

Insecticides have helped to control:

malaria, schistosomiasis, thyphus

Purification of drinking water lessened the threat of water-born epidemics:

Amoebiasis and hepatitis A

however,

Occurence of therapy resistant agents

Opportunistic infections have appeared (AIDS, organ transpl.)

Increased speed of disease spreading (globalisation)

Changing geographical distribution (climate changes)

CLASSES OF ORGANISMS THAT CAUSE INFECTIOUS DISEASES

VIRUSES

Obligate intracellular

CHLAMYDIAE

Obligate intracellular

RICKETTSIAE

Obligate intracellular

MYCOPLASMS

Extracellular

BACTERIA

Extracellular

*(Spirochetes,
Mycobacteria)*

Facultative intracellular

FUNGI

Superficial

Deep/Systemic

PROTOZOA

Extracellular

Intracellular

obligate

facultative

HELMINTHS

HOST DEFENCES AGAINST INFECTION

- » *Skin*
- » *Tears*
- » *Normal bacterial flora*
- » *Gastric acid*
- » *Bile*
- » *Salivary and pancreatic secretions*
- » *Filtration system of nasopharynx*
- » *Mucociliary blanket*
- » *Bronchial, cervical, urethral,
and prostatic secretions*
- » *Neutrophils*
- » *Monocytes*
- » *Complement*
- » *Stationary, mononuclear
phagocyte system*
- » *Immunoglobulins*
- » *Cell-mediated immunity*

VIRAL *INFECTION*

Viral replication in host cells

VIRAL *DISEASE*

Viral replication + tissue injury

Mechanisms of cell injury in viral infections

Direct

- ***Cell fusion***
- ***Formation of inclusions***
HSV, CMV, rabies, smallpox
- ***Cytolysis***
influenza, yellow fever, poliomyelitis

Indirect

- ***Immunmediated cell injury***
hepatitis B
- ***Secondary infections***

RESPIRATORY VIRUSES

- ***Influenza A,B,C,
Changing antigenic identities***
- ***Parainfluenza viruses (croup)***
- ***RSV (Paramyxovirus) 1-6 month of age***
- ***Adenoviruses (in children)***
- ***Measles (rubeola)***

VIRAL PNEUMONIAS

- ***MORPHOLOGY***

Interstitial pneumonia

- ***INFLAMMATORY INFILTRATION IN***

alveolar septa

peribronchial tissue

- *Hyalin membranes (ARDS)*

- *Necrotizing bronchiolitis (RSV)*

- *Hemorrhagic feature (Influenza)*

- *Squamous metaplasia of bronchial epithelium*

HERPESVIRUS INFECTIONS (DNA viruses)

HERPES SIMPLEX

TYPE 1, TYPE 2

VARICELLA - ZOSTER



HSV

VZV

neurotropic

HUMAN HERPES VIRUS

TYPE 6, 7

HUMAN HERPES VIRUS Type 8 (Kaposi's src.)

CYTOMEGALOVIRUS

EPSTEIN - BARR VIRUS

(Mononucleosis infectiosa

BURKITT'S lymphoma

Nasopharyngeal carcinoma)

Cytomegalovirus infection

Connatal

Perinatal

Postnatal

***Transmission: intrauterin, perinatal, suckling, body fluids,
respiratory, sexual, transfusion, transplantation***

Cytomegalovirus disease

- ***Connatal form: brain lesions
(microcephaly, cysts, periventricular calcification, hydrocephaly)***

***One of the most common opportunistic infections in
immunodeficiency***

- ***Myocarditis after transplantation***
- ***Generalised viral disease after transplantation***
- ***Generalised infection in AIDS patients***

EBV-Infection

- 1. Mononucleosis infectiosa*
- 2. Burkitt's lymphoma („stary sky”)*
- 3. Nasopharyngeal carcinoma*
- 4. PTLD*
(Post-transplant lymphoproliferative disorder)
- 5. Oral hairy leucoplakia (OHL)*

Bacterial infections

RESPIRATORY TRACT INFECTIONS

Lobar (pneumococcal) pneumonia:

Phases: *Streptococcus pneumoniae*

I. Congestion (1-2nd days)

(hyperemic capillaries, serous alveolar exsudate)

II. Red hepatization (3rd day)

(red blood cell rich serofibrinous alveolar exsudate)

III. Grey hepatization (4-5th days)

(degradation of RBCs, grey color due to the fibrin-filled alveoli containing macrophages and neutrophils)

IV. Yellow hepatization (7th day)

(massive neutrophil infiltration in the fibrin-filled alveoli)

V. Resolution (8-9th days)

(fibrinolytic dissolution of the exudate by neutrophils & mac.)

BACTERIAL TOXINS

EXOTOXINS

NEUROTOXINS

Clostridium tetani

Clostridium botulinum

TETANUS

BOTULISM

ENTEROTOXINS

Vibrio cholerae

Clostridium difficile

S. aureus

CHOLERA

COLITIS

FOOD POISONING

CYTOTOXINS

Clostridium perfringens

Corynebact. diphtheriae

GAS GANGRENE

DIPHTERIA

ENDOTOXINS - Gram-negativ bacteria

Common bacterial infections of the gastrointestinal tract

E. coli diarrhea

<i>Enterotoxigenic E. coli</i>	<i>travellers</i>
<i>Enteropathogenic E. coli</i>	<i>babies</i>
<i>Enterohemorrhagic E. coli</i>	<i>colon</i>
<i>Enteroinvasive E. coli</i>	<i>colon, distal ileum</i>

Salmonella enterocolitis

Fecal-oral transmission
superficial ulceration

Typhoid fever

Salmonella typhi ; Fecal –oral transmission; carrier status
Mucosal invasion and swelling, fibrinous necrosis, ulcerations
of Peyer patches, S.typhi passes into the circulation leading to
systemic infection

Cholera

Exotoxin effect /functional disturbances only/

Shigellosis (shigella dysentery)

Pseudomembranous colitis

Antibiotics associated colitis

Pseudomembranous colitis caused by Clostridium difficile

Acute enterocolitis: superficial ulceration

***Ulcers of the terminal ileum in
fatal typhoid fever: deep ulceration***

Pseudomembranous colitis: deep ulceration

Pseudopolyps (remaining islands of mucosa in the ulcerated area)

MENINGOCOCCAL INFECTIONS

GRAM negative DIPLOCOCCUS

Two fatal lesions:

I. Meningococcal meningitis

***FEVER, HEDACHE, STIFF NECK,
CONFUSION, VOMITING***

Tachycardia, Myocardial damage,

Purulent meningitis

II. Fulminant meningococcemia

Waterhouse-Fridericksen syndrome

II. WATERHOUSE -FRIDERICHSEN SY.

(Fulminant meningococemia)

(IN CHILDREN UNDER 5 YEARS)

- ***Rapid onset, fever, fulminant development of symptoms***
- ***Cutan hemorrhages, (purpura)***
- ***DIC***
- ***Endotoxin shock***
- ***Hemorrhagic necrosis of adrenals***

***PURULENT MENINGITIS MAY OR
MAY NOT BE PRESENT***

ZOONOTIC DISEASES*

** Infection is acquired from ANIMAL RESERVOIR*

BRUCELLOSIS

Granulomatous lesions

TULARAEMIA

Abscedating - granulomatous lesions

ANTHRAX

Haemorrhagic inflammation

LISTEROSIS

Septicaemia, meningitis

Granulomatosis infantiseptica

CAT-SCRATCH FEVER

Suppurative - granulomatous lesions

Tularemia

*Injury of the skin from the bites of a rabbit
infected with *Francisella tularensis**

→ Abscedating lymphadenitis

CAT SCRATCH DISEASE

- *Self limited infection caused by
Bartonella henselae*
- *Site of entry: skin, conjunctiva
(oculoglandular syndrome)*
- *Lymphadenitis:
suppurative and
granulomatous*

Sexually transmitted bacterial diseases

- ***Syphilis (lues)-Treponema pallidum***
- ***Gonorrhoea- Gonococcus***
- ***Ulcus molle (chancroid)***
(Hemophilus ducreyi)
- ***Granuloma inguinale***
(Calymmatobacter granulomatis)
- ***Lymphogranuloma venereum***
(Chlamydia trachomatis L1.L3))

CHLAMYDIAL DISEASES

- ***Psittacosis* /parrot fever, ornitosis/; *Chl. psittaci***
- ***Trachoma* /leading cause of blindness/; *Chl. trachomatis* A-C**
- ***Inclusion conjunctivitis* /paratrachoma/; *Chl. trach.* D-K**
- ***Lymphogranuloma venereum*; *Chl. trachomatis* L1, L3**
- ***Infections of the genital tract*; *Chl. trachomatis* D-K**
- ***Neonatal pneumonitis*;
*Chl. pneumoniae***



**SEXUALLY TRANSMITTED, Non-gonococcal urethritis (NGU),
SALPINGITIS → STERILITY**