

Process of Infection Propagation

Agents of Infection

Infectious agents are the disease-causing organisms. The characteristics of an agent that enable it to spread include:

- Pathogenicity - capacity to cause disease
- Virulence - ability to invade and cause serious disease.
- Toxicity - ability to harm by creating toxins
- Invasiveness - ability to penetrate host tissue and survive for some time
- Resistance to physical factors - extreme temperatures, radiation
- Dose of infection - quantity of agent that penetrates the organism

Spread of Infection

The principle of infection spreading depends on the ability of an agent to propagate. This criteria that determine this are

- Source of the agent
- The Mode of transmission of the agent
- Susceptibility of host to agent

Source of Agent

The source refers to where an agent lives. It is from the host that the agent is expelled to the external environment. It isn't necessary that the agent causes disease in the host.

The host can be a:

- Human during the incubation period (Hep A and B), the illness period or convalescence (e.g. diarrhoea).
- Animal in a similar manner to humans. (e.g. sheep, goats, hens, small rodents)
- The external environment (e.g. in legionnaire's disease, Mycoses)

Mode of Transmission

This is how the agent gets from its source to the host. It is the journey of the agent in the external environment. It is influenced by the way the agent is expelled from the source, its ability to survive in the external environment (e.g. survival ability of spores) and the site of entry into host.

This transmission can be **Direct** where the Host comes into contact with the agent.

- Contact - skin or mucosa
- Droplet - e.g. influenza
- Vertically - mother to foetus e.g. toxoplasma gondii*
- Perinatally - e.g. Neisseria gonorrhoea

Transmission can also be **Indirect**

- Contaminated objects e.g. towels
- Inoculation - e.g. injections
- By air - small droplets dry immediately and can remain in atmosphere for a long time
- Fecal-orally - by ingesting contaminated food or water.
- Contaminated soil
- Vector-borne - biological vectors like anopheles mosquito for malaria parasite, mechanical vectors like cockroaches contacting faeces.

Susceptibility of Host

This depends on

- Degree of Immunity
- Age when infected
- Nutritional status
- Present diseases
- Amount of agents infecting host
- Personal habits e.g. smoking, alcohol consumption

Prevention

Epidemiology aims to eradicate or eliminate infection and its transmission. This can be done by

- Liquidating the source of infection
- Destroying agent in external environment by disinfection
- Increasing the resistance of the population (e.g. vaccination) or preventing spread after infection (chemoprophylaxis)

Links

Related Articles

Bibliography

- BENCKO, Vladimir, et al. *Hygiene and epidemiology : selected chapters*. 2. edition. Prague. 2008. ISBN 80-246-0793-X.
- NICKERSON, Emma, et al. *Crash Course: Infectious Diseases*. 1st edition. 2007. ISBN 9780723433873.