

New viral infections

The spread of new infections is neither new nor typical of the 20th and 21st centuries. Only the rate of spread of new agents is changing, as well as diagnostic possibilities, international cooperation and the level of knowledge.

Emergence of new infections

- Spread of viruses from old outbreaks during lifestyle change (Ebola, Lassa).
- Transmission of animal viruses to humans (HIV).
- Emergence of new mutants (influenza, SARS).
- Emergence of new outbreaks of the virus (West Nile)
- Reintroduction of eliminated virus (Polio).

The main causes of the spread of new viruses

- Originally isolated areas are becoming accessible.
- Most of the new viruses come from tropical rainforests.
- Modern travel accelerates the spread of viruses.
- Large agglomerations facilitate the spread of viruses.

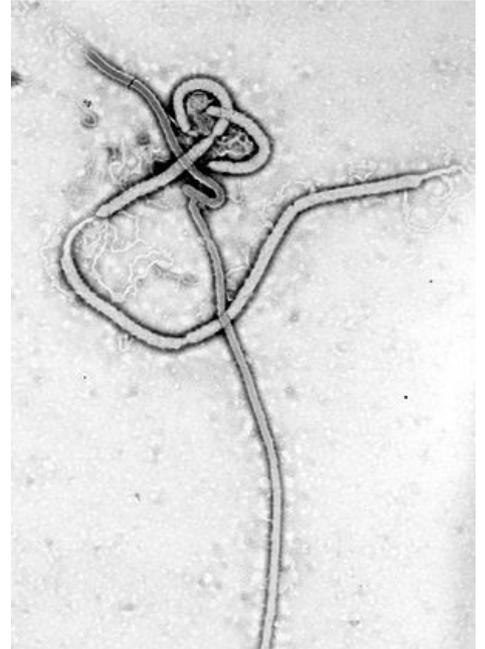
Hantavirus *Sin nombre*

- It appeared in 1993 in New Mexico.
- Infection causes fever with respiratory failure.
- A virus related to a number of Hantaviruses.
- The infection has the character of a natural focus, the reservoir is a white-tailed hamster.
- Interpersonal transmission is possible, there is no circulation in the population without a reservoir animal.
- Since then, several similar viruses with different symptoms have emerged (pneumonia, cardiomyopathy).

Ebola (Filoviridae)

See the Ebola page for more information

- The first epidemic in 1976 (South Sudan, Congo), since then a series of epidemics 1989 (Reston), 1995 Congo,...
- Hemorrhagic fever, close contact transmission (nursing, treatment of the dead, sexual intercourse).
- Dissemination will be limited by basic protective equipment.
- The reservoir is monkeys (processing the meat of caught or dead monkeys).



Ebola virus

Marburg (Filoviridae)

- 1967 An epidemic of monkey caregivers at the Behring pharmaceutical factory.
- The first of the hemorrhagic fevers caused by the family *Filoviridae*.
- **Transmission:** contact with monkeys or patients during incubation or with patients.
- 2004–2005 epidemic in Angola.

Lassa, Machupo, Junin (*Arenaviridae*)

- RNA viruses with cubic symmetry and envelope.
- Hosts are tiny mouse rodents in which the infection persists. Rodent urine transmission.
- Expansion around the world.
- In the Czech Republic, **virus LCM** (lymphocytic choriomeningitis).
 - Infections are less serious.
 - Serological diagnostics.
- Hemorrhagic fevers with high mortality.
- **Lassa** (1969) in southern Africa (mortality 10 %).
- **Machupo** (1963) in Bolivia.
- **Junin** in Argentina.

HIV 1 and 2 (*Retroviridae*)

- Adapted from monkeys (SIV).
- Now just interhuman transmission.

- The route of transmission from primates to humans is unclear.

See the HIV page for more information .

Nipah virus, Hendra virus

- Both viruses are zoonoses.
- Infection only breeders, no interpersonal transmission was found, except Nipah (Indian nurse Lini Putuserry became infected in Kerala in 2018 by Muhammad Sadik, whom she treated. Sadik was the first infected in Kerala).
- Nipah – An infection of pig farmers in Malaysia.
- Hendra – Horse breeders in Australia.

SARS virus

- The highest epidemic incidence in recent years (2002-2003). Beginning probably in China.
- Origin still unclear (recombinant, animal?).
- Diagnostic problems, high infectivity.
- Spread in respiratory and fecal-oral way.
- Exported to many countries around the world.
- Domestic transmission outside of Asia was only in Canada.
- Another fate of the virus is unclear - it circulates among animals, it has not been detected in humans since 2004.

See the SARS website for more information .

Virus West Nile

- An example of a virus that has spread beyond its original boundaries.
- The original enlargement of Eurasia and Africa.
- The cause of mild and severe meningoencephalitis.
- Reservoir birds, vector mosquito (*Culex*).
- Proven year-round persistence of the virus in the US and Canada.
- The habitat is expanding.

Monkeypox virus

- Epidemic in the USA 2003.
- The virus was imported from Africa through a pet shop (Gabon rat).
- It also spread through local rodents (prairie dogs).
- The problem of differential diagnosis (smallpox).

Imported arthropods transmitted infection

See the Arboviruses page for more information

Alphaviruses

- Host vertebrates (birds), vector mosquitoes, human only occasional host.

Flaviviruses

- Host various vertebrates, carriers of mosquitoes or ticks, human casual or significant host.
- Yellow fever virus.
- Dengue virus

Bunyaviruses

- Host various vertebrates, transmitters of mosquitoes, ticks or without carriers, some isolated only from arthropods.
- RNA viruses with helical symmetry and envelope.
- We have the viruses Ťahyňa, Tríbeč, Čaľovo.
- They usually cause mild infections.

New viruses without dramatic infections

- Metapneumovirus - the cause of respiratory infections from mild to severe (pneumonia).
 - It belongs to paramyxoviruses. Discovered in 2000.
 - Routine diagnostics is not available.
- Many tropical viruses transmitted by arthropods cause mild to moderate infections with almost zero mortality.

Major problems of emerging agents

Diagnostic problems

- Electron microscopy.
- Molecular genetic methods (PCR, sequencing).
- Cultivation and subsequent examination of antibodies.

Knowledge of the method of spread, prevention, treatment Problems of information dissemination

- Rapid dissemination of professional information.
- Dissemination of unprofessional information - panic among people.

References

Related articles

- Hemorrhagic fevers
- HIV
- Arboviruses
- Flaviviruses
- SARS

Source

ŽAMPACHOVÁ, Eva. *Přednášky a materiály dr. Žampachové ke stažení* [online]. [cit. 2012-01-07]. <<http://mujweb.cz/zampach/motol/?redirected=1521314685>>

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