10 A number of viral disorders

Viruses are obligatory intra cellular micro organisms. They need the functions of the cell for their own replication. They do this by forcing the cell to form DNA or RNA and proteins of the virus itself. The by everyone known computer viruses thank their name to the strong similarity with the ancient biological viruses. It stays an intriguing question if (cell depending) viruses could have been the forerunner of cellular life.

Many viral infections go by without symptoms. This gives a chance to the infected individual to become immune. For the surroundings it has the disadvantage that this unidentified carrier can infect many other people. Often the virus stays in the cells of our body for life. It later can get reactive again, as we know by herpes (cold sore) and chicken pox (shingles). The variability of many viruses gives problems to the defense mechanisms. We notice this amongst others with the AIDS virus. The previous virus and also some herpes viruses are furthermore able to rule out parts of the immune system, which can be totally disastrous for the defense mechanism. Several for us pathogenic viruses can also occur in animals. These reservoirs we for one find by yellow fever and rabies. The previous aspects influence the possibilities for prevention, suppressing and eradication. In the following table this is reflected schematically.

Hepatitis A (faecal-oral/ water borne/ food borne)

The worldly incidence is yearly a number of several millions. The high incidence provides a heavy burden although there is little lethality and serious complications. It is caused by the virus hepatitis A (HAV), which only occurs in one type over the whole world. This virus is usually transmitted directly from man to man (faecal-oral). It can survive a long time in surface water, possibly in crustaceans. This means that it is not advisable to take a (sea) bath in areas, where untreated sewerage is discharged and secondly to eat crustaceans from that water (a big epidemic took place in Porto, Portugal, in the seventies). Furthermore is the washing of food with contaminated water the frequent cause of infection.

Table: Characteristics of seven viral infections: case fatality rate, availability of effective vaccines, knowledge about the course, occurence of asymptomatic infections, persistence of the virus, detorioration of the immune system, variability of the virus, animal reservoirs of the virus. (source: Noo95).

	Small-pox	**rabies**	**polio**	**herpes**	**HBV**	**papilloma**	**HIV**
case fatality rate	30 %	100%	Mode-rate	-	moderate	after years: poss. cerv. cancer	approx 100 % without drugs
good vaccin available?	yes	yes	yes	no	yes	no	no
knowledge of the course?	yes	yes	yes	yes	yes	still too little	too little yet
asymptom. infections ?	no	no	mostly	yes	yes	yes	yes
persists in the body?	no	no	no	yes	yes	yes	until death
detoriorates imm. syst.?	no	no	no	yes	no	no	yes
variabilitity of virus	low	no	3 types	8 types	no	> 80 types	high
Animal reservoirs?	no	yes	no #	yes	no #	yes	no*

* related viruses in apes

can stay active outside man for a long period, given favorable circumstances

The incubation period is four up to six weeks. The symptoms are tiredness, bad appetite and nausea, which usually goes along with jaundice and sometimes also a light fever. Travellers to endemic areas get for short trips protecting immune globulins. For a little while now there exists a vaccine against hepatitis A. The WHO has the intention to rule out the disease now this vaccine is available. The target date was set for the year 2000.

Hepatitis B (blood borne; SOA)

Goes along with the symptom jaundice as well. The incubation period is longer compared with hepatitis A, making it unclear of the origin of the infection (up to 1,5 year). This disease also used to be called serum hepatitis. For the reason that the disease rather often was caused by a medical interference such as blood transfusion. Nowadays blood is checked on the virus hepatitis B (HBV; five groups); however on hepatitis C and HIV as well. More than two milliard people (two on five people in the world) have been infected by HBV (antibodies).

300 Million (more than 5 percent of the world population) are chronically infected carriers who are contagious for others. A quarter of them (75 million people) run a risk of dangerous complications such as liver cirrhoses and liver cancer. A part of them will eventually die from the consequences of hepatitis B. A good vaccine is available, although not very cheap. In our country employers often compensate the costs of the vaccine for people who are exposed

(medical workers). The great need however exists in developing countries. In The Netherlands less than 1 percent of the population has (ever) been infected.

Rabies (bite wounds)

Still about 40,000 people in the world die yearly of this horrible disease, one on the 13000 deaths. Approximately 6 million people per year are treated for it. Not all of them of course would have gotten the disease, but no risks are taken and one does not wait till the symptoms show up; because this will mean a case fatality rate of 100 percent. The treatment is however painful and expensive. A little infection of people exists in The Netherlands; relatively often bats are the cause. The already developed vaccine by Pasteur is good, however only when it is administered in time. The potential victim also gets immune globulins (just like with the prevention of tetanus wounds). A rabid animal that has bitten should not be killed. It must be caged, then when it dies it can be determined whether it had rabies or not.

Polio(-myelitis) (faecal-oral)

Three types can cause polio. The last type caused an epidemic in The Netherlands in the end of 1992 and beginning of 1993. The older the patient is the worse the symptoms and consequences get. These can be the following: death from paralysis of the breathing muscles, but also staying invalidity from paralysis of the legs especially. There is a so-called polio paradox. In developing countries nearly everyone gets polio at a very young age, so relatively without consequences (compare: diphtheria). In countries far from the equator people got it at later age, mainly among rich families, and usually with many consequences. Nowadays a vaccination exists. The Salk vaccine is injected (for example in The Netherlands and the Sabin vaccine is given in a sugar lump (like in Belgium). The last one gives the advantage that unvaccinated children in a school class also can get infected and still can make antibodies. In The Netherlands many unvaccinated people exist in clusters: areas with strictly religious people who refuse vaccinations. In this case ‘herd community’ does not work. The WHO had the year 2000 as the extreme target date for the eradication of polio: in America the disease is already ruled out (see map).