Measures for preventing human rabies. Vaccination before and after infection

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Summary: The only means of treating human rabies is still immunotherapy applied as soon as possible after infection.

The vaccines currently in use are propagated in cell cultures, inactivated and then concentrated. Antirabies serum and human immunoglobulins are the indispensable complements to vaccine in cases of severe bites.

Antirabies vaccine may be administered before exposure to subjects at risk, or after exposure according to the schedule recommended by WHO.

Subunit vaccines and vaccines obtained by genetic recombination may be the vaccines of the future.


More than 100 years after Louis Pasteur's discovery, the only way of treating human rabies is still immunotherapy applied as soon as possible after infection.

1. The means available for this have improved considerably over the century. Virus propagated in nerve tissue and attenuated by desiccation (Pasteur) has been abandoned. Virus treated with phenol (Fermi or Semple) is still used, but not recommended (because of neuropathological complications), particularly if the tissue has not been obtained from newborn animals (Fuenzalida). Virus propagated in chick embryos or duck embryos has been replaced progressively by that propagated in cell cultures, inactivated and then concentrated. Among the cells used are the human diploid cell line WI-38 (USA and France) and simian cells (USA).

Primary cells obtained from cattle (France), dogs (Netherlands), hamsters (USSR and China) and fowls (Federal Republic of Germany) are also used widely, but the yields are quite low. The cells of a continuous line (Vero) which has been licensed recently yield a better product. Antirabies serum (usually of equine origin) and human immunoglobulins (obtained from volunteers vaccinated several times) are the indispensable complements to vaccine in cases of severe bites.

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2. Methods of using vaccine are:

- before exposure, in subjects at risk (veterinarians, laboratory technicians, etc.) consisting of two or three injections with the first booster dose after a year, and subsequent doses every two or three years;

- after exposure: the schedule recommended in 1984 by the WHO consists of injecting 1 ml of vaccine on days 0, 3, 7, 14 and 30 after infection. A simplification of this treatment, currently being studied, is the use of small, multiple doses by the intradermal route (Thailand), or by giving intramuscular injections only on days 0 (double dose), 7 and 21 (France and Yugoslavia).

3. Future vaccines might be subunit vaccines (glycoprotein or peptide, usually attached to liposomes) and vaccines obtained by genetic recombination (e.g. the gene coding for glycoprotein, introduced into vaccinia virus), utilising vectors which may then be inactivated for human use.