

Rabies treatment of health care staff

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Summary

This article deals with post-exposure treatment of contacts of human cases of rabies. Experience suggests that rabies is hardly ever transmitted from person to person if at all. With the modern generation of vaccines against rabies, the use of post-exposure treatment is more widespread. A lot of contacts of patients with rabies in developed countries are treated, most of them being health

care workers. This treatment is however not practised so often in developing countries where the supply of highly protective vaccines with a few side effects is low. According to reports good hygienic practice in nursing these patients is well established.

Key words: health care staff; post-exposure treatment; rabies; rabies vaccines

Introduction

All over the world we are becoming increasingly aware that we are at risk from many new and some re-emerging old infectious agents. At the end of the 20th century many different infectious diseases have been recognised as a threat to public health [1] and health care staff. Some of them are preventable by hygienic measures, chemoprophylaxis or vaccinations. For some other infectious diseases however, development of new vaccines is still in progress.

In this world of mass migration and global travel, any emerging or re-emerging infectious disease can be a threat to health care workers. Medical professionals are extremely concerned

about occurrence, causes, and consequences of emerging and re-emerging infectious diseases. Tuberculosis, hepatitis C, AIDS, some haemorrhagic fevers, infectious diarrhoeas including cholera, and malaria, affect millions of people worldwide. Most of these diseases can also be transmitted to health care workers.

Vaccines against hepatitis B and against influenza are routinely used worldwide for prevention of infectious diseases among health care workers. Some vaccines are used only rarely or in epidemiological indications – vaccine against meningococcal diseases, diphtheria, whooping cough, rubella and also rabies.

Epidemiology

Rabies is classified into re-emerging infectious diseases. It is present almost all over the world [2]. The disease has re-emerged as a threat due to several recent epidemics affecting wild animals. The situation with rabies is still serious in the Russian Federation and is re-emerging in animals particularly in some parts of the USA, Central America and Asia.

Each year about 35,000 to 100,000 human rabies deaths occur around the world, and more than 6.5 million people need post-exposure treatment (PET). Most of the rabies cases could be prevented by efficient treatment [3].

Protection of health-care personnel

How to protect health care personnel from the possibility of contracting some infectious diseases, including rabies, is a matter of continuous discussion. These discussions focus on health care personnel, their managers and expert workers, responsible for prevention of hospital infections.

Some vaccines, which are used for exposed health care personnel, we can learn about from elementary medical books; for other vaccines, such as rabies vaccine, we can rarely find reports in medical journals.

It is often supposed that a human case of rabies could be a potential source of infection for health care personnel responsible for caring for the patient [4]. Rabies virus was isolated from many tissues and fluids of infected patients: tracheal secretions, sputum, lachrymal gland, saliva, salivary glands, nasal swabs, pharyngeal swabs, eye swabs, cerebrospinal fluid, urine, blood, serum, peripheral nerve, skeletal muscle, skin, heart, liver, adrenal, kidney, lung, spleen, pancreas, brain [4–6].

Pre- and post-exposure treatment

In Europe, where human cases are rarely seen, and are usually imported [7, 8], pre-exposure treatment of health care personnel is not indicated. In a case of care for the patient with laboratory or histologically-confirmed rabies, the post-exposure treatment of all contacts including the health care personnel is practised [4–6]. The same practice is also used in the United States [9], Chile [10] and other parts of the world. The average number of contacts (hospital staff, family and other contacts) that require post-exposure treatment is approximately 50 per case in France [5] and between 41 and 55 per case in the United States [11]. The highest number of 209 post-exposure treatment in Europe was observed in France; in the United States this number was even higher and reached 290 treated after contact with one case of human rabies.

Delays in diagnosis greatly increase the number of contacts that require post-exposure treatment. The number of people in contact with humans with rabies can be high because of intensive medical care, longer survival times and care in two or more hospitals. Many request rabies prophylaxis [12, 13] and most of them are health care personnel.

In underdeveloped countries, the situation is somewhat different. The procedure is based on health education with emphasis on preventative measures. These measures are designed to prevent transmission amongst family members, particularly when a patient with rabies is cared for at home [14]. Data of post-exposure treatment of contacts are missing.

As we can see from experiences and practices in developed and underdeveloped countries, there are some discrepancies in statements on this subject. Rabies virus is present in variety of human fluids and tissues, but there are only eight well-documented reports of human to human transmission

in corneal transplant recipients [6, 15]. Two non-laboratory confirmed cases of human-to-human transmission were described in the year 1996 in Ethiopia [16]. The route of exposure was direct salivary contact from another human – a kiss and a bite.

It is vitally important that all preventive measures are applied particularly when working with infected saliva, other tissue and fluids of rabid patients (use of gloves, protective glasses/goggles, mask, careful and thorough procedure with devices during aspiration). Specific post-exposure rabies treatment with vaccines and human rabies immunoglobulins are sometimes considered as well [13].

In the public health sector, we have had very good experience in post-exposure treatment against rabies with highly purified tissue culture rabies vaccines [3]. These experiences are welcomed worldwide and the positive impact of the 2nd generation cell culture rabies vaccines in controlling human rabies is obvious.

Some infectious diseases are very rarely transmitted from human to human; or this route of transmission is difficult to prove [17]. Safe and efficient cell-culture rabies vaccines are available [18, 19] – therefore, if post-exposure treatment is indicated for health care personnel, this should be carried out using one of these modern vaccines and by no means with substandard nerve tissue derived rabies vaccines.

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References

- 1 Wilson L. Focus on emerging infectious diseases. *Med Sci Bull* 1996;18(8):6.
- 2 Mandel GL, Douglas ER, Bents JE. *Principles of Infectious Diseases*. 4th Edition, Churchill Livingstone; New York: 1995, 2798.
- 3 Meslin FX, Fishbein DB, Matter HC. Rationale and prospects for rabies elimination in developing countries. In: Rupprecht CE, Dietzschold B, Koprowski H, editors. *Lyssaviruses*. New York: Springer-Verlag, 1994:1–26.
- 4 Gacouin A, Bourhy H, Renaud J C, Camus C, Supron E, Thomas R. Human rabies despite postexposure vaccination. *Eur J Clin Microbiol Infect Dis* 1999;18:233–5.
- 5 Crepin P, Audry L, Rotivel Y, Gacouin A, Caroff C, Bourhy H. Intravital diagnosis of human rabies by PCR using saliva and cerebrospinal fluid. *Journal of Clinical Microbiology* 1998;36: 1117–21.
- 6 Hemlick C, Tauxe V, Vernon A. Is there a risk of contacts of patients with rabies? *Reviews of Infectious Diseases* 1987;9: 511–48.
- 7 Rotivel Y, Bourhy H, Wirth S, Goundal M, Tsiang H. Imported human rabies cases in France. *Rabies bulletin Europe. Information Surveillance Report, WHO Collaborating Centre for Rabies Surveillance and Research* 1997;4:14.
- 8 WHO. Travel and health. A case of human rabies contracted in Nigeria. *WER* 1997;22:163–4.
- 9 CDC. Human Rabies – Washington, 1995. *MMWR* 1995;44 (34):625–7.
- 10 Favi M, Mattos CA, Young V, Chala E, Lopez LR, Mattos CC. First case of human rabies in Chile caused by an insectivorous bat virus variant. *Emerg Inf Dis* 2002;1:79–81.
- 11 Drenzek CL, Noah DL, Smith JS, Rupprecht CE, Krebs JV, Fekadu MA, Childs JE. Human rabies in the United States. 1980 to 1986: epidemiologic and clinical features, p.82. In *Abstract of the Seventh Annual International Meeting on Advances towards Rabies Control in the Americas* (cited Chaplin).
- 12 Report of the 3rd International Symposium on Rabies in Asia, Wuhan, China 11–15 September 1996, WHO/EMC/ZOO/ 96.8, 1–21.
- 13 Noah DL, Drenzek CL, Smith JS, Krebs JW, Orciari L, Shaddock J, et al. Epidemiology of human rabies in the United States, 1980 to 1996. *Annals of Internal Medicine* 1998;128:922–30.
- 14 CDC. Human Rabies – Montana and Washington, 1997. *MMWR* 1997;46(33):770–4.
- 15 Human rabies prevention – United States, 1999. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1999;48 No RR1.
- 16 Fekadu M, Endeshaw T, Wondimagegnehu A, Bogale Y, Teshager T, Olson JG. Possible human-to-human transmission of rabies in Ethiopia. *Ethiop Med J* 1996;34:123–7 (cit.8)
- 17 Stantic-Pavlinic M, V Cec, J Mehle. Brucellosis in spouses and the possibility of interhuman infection. *Infection* 1983;11: 313–3.
- 18 WHO Recommendations on Rabies Post-Exposure Treatment and the Correct Technique of Intradermal Immunization against Rabies. WHO/EMZ/ZOO.96.6. Division of Emerging and other Communicable Diseases Surveillance and Control, World Health Organization, 1997. WHO.
- 19 Stantiè-Pavliniè M. Rabies in Central Europe – recent experiences. The 10th international rabies in the Americas meeting; 1999 Nov 14–19; San Diego. San Diego: S.n., 1999; 33.

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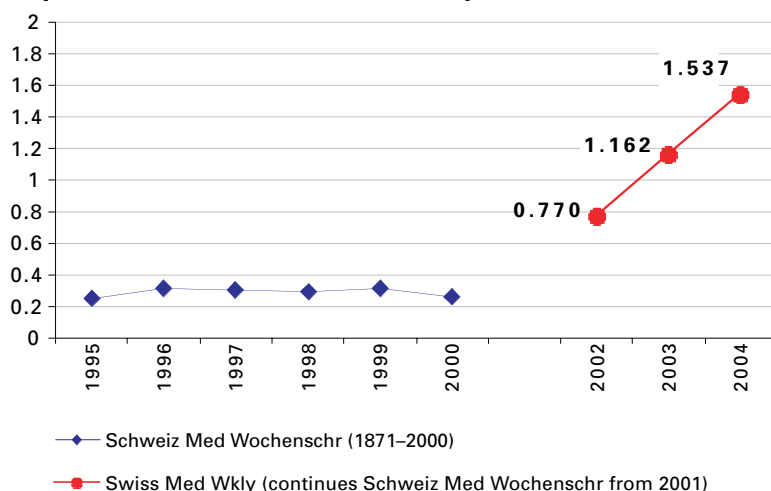
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