

Rabies vaccination and interpretation of rabies serology



Advice for bat workers and their GPs

Rabies vaccines in use in the UK (Rabies Vaccine BP and Rabipur) generate good antibody responses that are long lasting after boosters. The protective level of antibodies accepted by the World Health Organization (WHO) is 0.5 IU/ml. Although the effectiveness of vaccination has not been tested in humans by experimental exposure to rabies, there have been no reported cases of human rabies when recommended schedules for pre and post-exposure rabies vaccination are followed, irrespective of antibody levels (but these are usually unknown).

Moving from general recommendations to recommendations for each individual is sometimes hard. Much of the evidence we have comes from clinical trials where many factors are controlled (for example, people with health problems are excluded from taking part, and vaccination occurs at a specific time). Also, correlating antibody levels in people who have had different numbers of doses of vaccines over irregular time periods is difficult and the literature on which to base decisions is not extensive. A study of Bat workers' antibody responses carried out by the Health Protection Agency (HPA) and Veterinary Laboratory Agency (VLA) with English Nature and The Bat Conservation Trust in 2004/5 has shed some light on this area.

Please note that whenever a possible rabies exposure occurs, such as through a bat bite, then a clinical assessment always needs to be made by the Health Protection Agency (usually via your GP) to decide whether or not post-exposure vaccination is indicated, no matter how many previous vaccinations you have received and irrespective of antibody levels. Pre-exposure rabies vaccination is only the start of a course of vaccine that should always be completed if a possible exposure to rabies virus occurs.

Guidelines for rabies booster vaccination of bat workers at continuous risk of exposure

These are condensed from the 2005 revised rabies chapter in the Department of Health's Immunisation against Infectious Disease:
<http://www.dh.gov.uk/assetRoot/04/12/44/91/04124491.pdf>. For primary immunisation, three doses of rabies vaccine should be given on days 0, 7 and 28 by intramuscular injection in the deltoid region. A single booster should be given one year after the primary course and subsequent boosters at 3-5 yearly intervals.

1. Timing of First booster.

Antibody levels fall after immunisation with rabies inactivated vaccines. The speed of this decline is vaccine specific, and is faster after primary immunisation than after subsequent boosters. It is rational, therefore, to have different policies for the intervals between the primary course and the first booster than between the first and subsequent booster vaccinations. New guidance (2005) recommends that the first booster be given one year after the primary rabies vaccination course, irrespective of whether 3 or 5 doses of vaccine were given for the primary course.

2. Subsequent boosters.

Once a first booster has been received, antibody levels seemed to be maintained in the longer term and boosters for those who remain at ongoing risk can be given every 3-5 years.

3. The role of serology (antibody testing, or titre tests)

Blood tests are not routinely recommended. Serology is currently only recommended for those who have had a severe reaction to a previous dose of vaccine. The likelihood of a reaction to rabies vaccination, such as painful swelling of the vaccination site or, less commonly, fever and other flu-like symptoms, increases with increasing number of doses and is the most frequent reason for wanting to delay boosting. Testing is available in other circumstances, but the NHS does not currently fund this. Further advice can be obtained via your GP from the HPA Centre for Infections (telephone 020 8200 6868)

The interpretation of results is not straightforward and should be done in the context of an individual's medical history. However, as in general if antibody levels are:

- Less than 0.5 IU/ml then boosting is required immediately.
- 0.5 IU/ml or more but less than 30 IU/ml then boosting can be delayed by 1 year.
- Above 30 IU/ml then boosting can probably be delayed by 3 years

Please note that this is what is proposed by the HPA, rather than official government policy, but it is similar to policy in other countries such as France.

4. Sources of further information, testing, and pre-exposure vaccine and post exposure treatment

Access to advice and vaccine (for occupational vaccination) and post-exposure vaccine and immunoglobulin

Vaccine for bat workers is available free of charge from the Health Protection Agency. For pre-exposure (occupational) requests GPs need to send a fax with details of the patient's name, date of birth, the name of the conservation group (e.g. English Nature), and their full vaccination history to:

Vaccine Clerk, Rabies Office, HPA Virus Reference Department
Fax 020 8200 1569

For post-exposure vaccine and/or advice please contact your local HPA Health Protection Unit (find your local unit through http://www.hpa.org.uk/lars_hpus.htm) or the Duty Doctor at the HPA Centre for Infections (telephone 020 8200 6868).

Access to serological testing (antibody or titre levels)

Testing is carried out by the Rabies Virology Department, Veterinary Laboratories Agency – Weybridge via your local laboratory. Testing is not currently provided free of charge by the NHS.

Further information

Department of health guidance on rabies vaccination:

<http://www.dh.gov.uk/assetRoot/04/12/44/91/04124491.pdf>

Health Protection Agency guidance for duty doctors (including post exposure treatment):

http://www.hpa.org.uk/infections/topics_az/rabies/HPA_Rabies_protocol_April2006.pdf