WHO Position Paper on Rabies Vaccine - 6 August 2010

Grading of scientific evidence

Table II: Duration of immunity following pre- or post-exposure immunization with cell-culture-based rabies vaccines

Settings: Global

**Question:** What is the scientific evidence that pre- or post-exposure immunization using cell-culture based rabies vaccines (by intramuscular or intradermal administration) provide long-term (≥10 years) immunity against rabies?

**Conclusion:** Moderate scientific evidence that using cell-culture-derived rabies vaccines induces ≥10 years of immunity against rabies.

1Include cell culture-derived rabies vaccines based on human diploid cells (HDCV), Vero cells (PVRV), chick embryo cells (PCECV), hamster kidney cells (PHKCV) and duck embryo cells (PDEV)

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Summary of findings</th>
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<tbody>
<tr>
<td>No. of studies</td>
<td>Design</td>
</tr>
<tr>
<td>4</td>
<td>Observational¹</td>
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¹ Normally, observational studies achieve only low quality of evidence in the currently used grading system. However, all of these 4 long-term studies showed immunity lasting for ≥10 years. This is also in line with most studies with observation periods of <10 years that do not suggest waning of immunity/immunological memory with time. Besides, immunity appears to persist even when antibodies are no longer detectable (Gherardin AW et al 2001). Therefore, the scientific evidence that cell-culture derived rabies vaccines induce ≥10 years of immunity is upgraded from low to moderate.

Thraenhart O et al (1994) demonstrated neutralizing antibodies and elicited anamnestic responses in of all the 18 vaccinees 2 - 14 years after immunization; the anti-rabies T and B cell response showed no time-dependent pattern. Suwansrinon K et al (2006) carried out a prospective study on 118 vaccinees 5-21 years after pre- or post-exposure regimens, using cell-culture vaccines for either i.m. or i.d. administration. Neutralizing antibody was detected in the sera of all subjects and following i.d. booster injections on days 0 and 3, all except one subject showed an accelerated antibody response. Malerczyk C et al (2007) found neutralizing antibody concentrations ≥0.5 IU/ mL and anamnestic responses in all of 10 persons who 15 years earlier had received primary PCECV immunization, followed by one booster dose after one year. Brown D et al (2008) demonstrated durable immune responses among 89 individuals who 1-12 years earlier had received a primary i.d. series of HDCV. Antibody concentrations (≥ 0.5 IU/ml) were found consistently, including in the 8 persons who had been immunized 10-12 years earlier.

References


