Author(s): SAGE working group on PPV23

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Question: Should repeated doses of PPV23 be used for prevention of pneumococcal disease?

Settings: General

Conclusion: Very low quality evidence in support of a beneficial effect of revaccination

<table>
<thead>
<tr>
<th>Quality assessment</th>
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<tbody>
<tr>
<td>No of studies</td>
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<tr>
<td>Evidence of decrease of protection overtime after receipt of one dose of PPV23 (follow-up &gt;9 years)</td>
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<td>2  observational study²</td>
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<td>Benefits conferred by an additional dose of PPV23 for prevention of pneumococcal disease</td>
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<td>2  observational study</td>
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<td>Safety of revaccination</td>
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<td>7  randomised trial⁷</td>
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¹ The upper limit of follow up is not specified. In one of the two studies, the last category analysed was >9 years following vaccination and in the other study >5 years

² Two studies have evaluated the duration of clinical protection. In addition there are multiple studies showing that the levels of vaccine-induced antibodies decrease over time although there is general concurrence that antibody levels after primary vaccination with PPV23 persist at levels above those in unvaccinated individuals for at least 5 years. Interpretation of these studies is complicated by the fact that most studies focus on only a few serotypes (up to 6) and serotypes behave differently.

³ Cannot directly derive an estimate of vaccine efficacy.

⁴ In the study by Shapiro et al there was a trend across all age groups towards decreasing protection with increasing time (<3 yr, 3-5 yr and >5 yrs) since vaccination. In the indirect cohort study reported by Butler et al. vaccine effectiveness five through eight years after vaccination was estimated to be 71% (95% CI, 24% to 89%) and nine or more years after vaccination was 80% (95% CI, 16% to 95%) whereas the estimated effectiveness among immunocompetent persons aged >= 65 yrs was 75% (95%CI 57 to 85). Hence, the 95% CI were overlapping. The point estimates of effectiveness <2 years and 2-4 years after vaccination were lower than after 5-8 years or >9 years after vaccination.

⁵ One study looked at the 14 and 23 valent vaccines and one study looked at the 14 valent vaccine.

⁶ Wide confidence limits - see footnote 7. Not further downgraded in view of the trends in the point estimates

⁷ Two studies evaluated the effectiveness of revaccination against invasive pneumococcal disease. In an indirect cohort study among Alaska Native adults (mean age 45 years), the point estimates of vaccine effectiveness were similar for a first vaccination (VE, 75%; 95% CI, 19% to 92%) and for revaccination (VE, 74%; 95% CI, <0 to 94%), although the estimates for revaccination were not statistically significant (Singleton et al). In a case control study in Navajo adults (Benin et al.), revaccination was not associated with a reduction in risk of invasive pneumococcal disease (VE, 40%; 95% CI, -27% to 72%). However, that study also did not document an overall effectiveness of pneumococcal polysaccharide vaccination, and the estimate of effectiveness following revaccination was not significantly different from that following any vaccination.

⁸ See footnote 7 - wide CI

⁹ The best and largest study was a randomized control trial (Jackson et al)

¹⁰ Although reports from the 1970s and 1980s suggested that revaccination of healthy children and adults within a few years of a first vaccination may be associated with a higher than expected frequency and severity of local injection site reactions, several more recent studies of older adults indicate that a second vaccination given 5 or more years after a first vaccination is well tolerated.

¹¹ For common minor reactions, good precision. No serious events detected, but studies lacked power.

Bibliography:


