Review: Pneumococcal vaccination does not prevent pneumonia or death in adults


**Question**
Is pneumococcal vaccination effective in preventing disease or death in adults?

**Data Sources**
Studies were identified by searching the Cochrane Central Register of Controlled Trials, MEDLINE (1966 to June 2003), and EMBASE/Excerpta Medica (1974 to June 2003); scanning the bibliographies of relevant studies and reviews; and contacting experts in the field.

**Study Selection and Assessment**
Studies were selected if they were randomized or quasirandomized controlled trials (RCTs) or nonrandomized studies comparing polysaccharide pneumococcal vaccines with placebo, control vaccines, or no intervention in adults (≥16 y). A quality assessment of the RCTs was done using the Jadad scale (0 to 5 points).

**Outcomes**
For RCTs, the outcomes included pneumococcal pneumonia, all-cause pneumonia, pneumonia mortality, and all-cause mortality.

**Main Results**
15 RCTs met the selection criteria. The trials included 75197 patients, and follow-up ranged from 18 months to 4 years. 3 trials involved older persons, and 3 trials involved patients with chronic disease. The publication date of the trials ranged from 1947 to 1999, with 14 published since 1976, 10 published since 1980, and 3 published since 1990. 7 of 15 trials with a median publication date of 1987 scored ≥3 out of 5 for study quality; 8 trials with a median publication date of 1977 scored ≤2. Because of significant heterogeneity due to publication year, a random-effects model was used. 14 trials that evaluated all-cause pneumonia had a combined result that appeared to favor pneumococcal vaccines, but this was not statistically significant (Table). 11 trials that evaluated all-cause mortality showed no benefit of vaccination (Table). Results for pneumococcal pneumonia and pneumonia mortality were heterogenous, with more recent trials showing no effect.

**Conclusion**
Pneumococcal vaccination is not effective in preventing disease or death in adults. Source of funding: Not stated.

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<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Number of trials (number of participants)</th>
<th>Weighted event rates</th>
<th>RRR (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-cause pneumonia</td>
<td>14 (75 008)</td>
<td>2.9%</td>
<td>3.9%</td>
<td>22%</td>
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<tr>
<td></td>
<td></td>
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<td>(-1 to 40)</td>
<td>(50 to ∞)</td>
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<tr>
<td>All-cause mortality</td>
<td>11 (72 404)</td>
<td>7.2%</td>
<td>7.2%</td>
<td>9%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(-6 to 22)</td>
<td></td>
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*Abbreviations defined in Glossary; weighted event rates, RRR, NNT, and CI calculated from data in article using a random-effects model. Follow-up ranged from 18 months to 4 years. **Borderline significance.

**Commentary**
Infection with *Streptococcus pneumonia* is a major cause of morbidity and mortality, especially at the extremes of age. For example, the risk for invasive pneumococcal disease increases with increasing age from 5 per 100 000 at age 50, to 60 per 100 000 by age 85 (1). When the first pneumococcal vaccines were introduced in the mid-1940s, this organism was very sensitive to penicillin. Now, resistance to penicillin approaches 35% (2).

As *S. pneumonia* increases its resistance to β-lactam antibiotics, physicians must realize that the current pneumococcal vaccine should not be relied on to reduce the incidence or mortality of pneumococcal pneumonia. It is also unlikely that expansion of use of the current vaccine to the general population would be of any benefit.

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**References**