Pneumococcal vaccination for older persons

No. 2018/05

Executive summary

Health Council of the Netherlands

Many people carry pneumococcal bacteria without becoming ill. However, pneumococci can cause serious illness and mortality. Young children are the primary carriers and spreaders of pneumococci in the population. Children, older persons (aged 60 years and over) and those with an immune system that does not function optimally are particularly susceptible to pneumococcal infections. In the Netherlands, pneumococcal vaccinations are recommended for children and persons in high-risk groups. The Minister of Health, Welfare and Sport has asked the Health Council of the Netherlands whether older persons should also be vaccinated against pneumococcal infections. This is already the case in many EU countries. The Committee on Vaccinations has discussed this question. The Committee recommends that older persons aged 60 and above should be offered vaccination with the PPV23 vaccine, which provides protection against 23 relatively widely circulating pneumococcal serotypes. Vaccination should be repeated every five years, up to and including the age of 75 years.

The disease burden caused by pneumococcal infections is considerable

Pneumococci can cause severe and less severe infections among older persons. Pneumococcal lung infections can be fatal, especially in older persons with additional health conditions. Pneumonia is the most common condition caused by pneumococcal infections in older persons. Of all patients who are hospitalised with pneumonia, pneumococci are estimated to be the causative agent in 20 to 30% of cases; this concerns an estimated 2,600 to 5,600 people over 65 years of age every year. There is uncertainty concerning these figures, however, because registration of the incidence of pneumonia in primary care is limited, and it is not known how many of these cases of pneumonia are caused by pneumococci. Patients with invasive pneumococcal disease (IPD: pneumococcal meningitis, blood poisoning or invasive pneumococcal pneumonia) are almost always admitted to hospital and their health is often more severely affected than in cases of non-invasive pneumococcal pneumonia. Annually, an estimated 1,800 people over 60 years of age develop IPD (of which 80% are cases of invasive pneumococcal pneumonia). Mortality in hospitalised patients over 60 years of age with pneumococcal disease is estimated to be 15% on average. In addition, patients who survive pneumococcal disease are estimated to be 15% more likely to die for several years thereafter.

Vaccination of children and high-risk groups: limited protection for older persons

The current vaccination policy for high-risk groups with a seriously compromised immune system hardly provides any protection for older persons. Approximately 42,000 people receive this vaccination annually, while there are over 200,000 people aged 60 alone. Moreover, the vaccine used for this group does not provide

indirect protection for older persons (group protection).

The current vaccination of children provides limited indirect protection for older persons. Young children in particular are carriers of relatively large quantities of different types of pneumococcal bacteria because their immune defences have yet to fully develop. This means that they are the most important source of dissemination and infection in the population. The vaccine used in children does lead to group protection. For this reason, the vaccination of children will over time lead to a reduction in the number of carriers of the bacterial types in the vaccine in the population as a whole. Other types of pneumococcal bacteria (with a generally lower disease-causing potential) will take their place. The total disease burden caused by pneumococcal bacteria in older persons has fallen slightly due to the vaccination of children, but there remain sufficient grounds to consider additional measures.

New vaccination strategies

In order to provide better protection for older people against pneumococcal infections, different vaccination strategies are conceivable: the vaccination of older persons with one of the available vaccines; or the vaccination of children against more types of pneumococci in order to increase the indirect protection of older persons. After consulting with the Committee, the National Institute for Public Health and the Environment (RIVM) carried out a cost-effectiveness analysis. This revealed that repeat vaccination of the over-60s with the vaccine PPV23 is an efficient strategy (in addition to the existing vaccinations for children). Compared to the alternatives, this strategy would be the most effective and cost the least.

The Committee adopted a conservative estimate of the effectiveness of PPV23 among the over-60s: in the five-year period after vaccination, the average effect of the vaccine types on IPD is 37%, and the effect on pneumococcal pneumonia caused by the vaccine types is 7.5%. After five years the vaccine ceases to be effective, but revaccination can provide continued protection. The greatest health benefits would be achieved by vaccinating persons between the ages of 60 and 75 every five years. More frequent vaccination is not recommended because it cannot be ruled out that the vaccine may then become less effective (hypo-responsiveness). The Committee has set the limit at 75 years of age because there is insufficient evidence concerning effectiveness in older persons aged over 80 years, and it finds it plausible that in this group of people the effectiveness will generally be more limited. The cost-effectiveness of this strategy is relatively good: the associated cost amounts to less than €9,000 per life year gained in perfect health (QALY). Sensitivity analyses show that this strategy would remain cost-effective even under the most unfavourable scenarios assuming a limit of €20,000 per QALY, which has frequently been used in the Netherlands in relation to preventive interventions.

A single randomised study into the effectiveness of a different vaccination - the vaccination of older persons with the conjugate vaccine PCV13 (which protects against 13 types of pneumococci) - has recently been published. This showed that the effectiveness against IPD caused by the vaccine types was 76%, effectiveness against pneumococcal pneumonia caused by the vaccine types was 38%, and effectiveness against pneumococcal pneumonia regardless of the causative agent was 5%. This study had a follow-up of four years at the time of publication, which means that it remains somewhat unclear whether long-term protection is achieved. Neither do we know anything about the possible effects of revaccination. Furthermore, since the study, infections with the ten serotypes that are present in both PCV13 and PCV10 have become less common due to the vaccination of children with PCV10. Therefore, the long-term effectiveness of vaccinating older persons with PCV13 remains currently uncertain. In addition, the vaccination of older persons with PCV13 would prevent less disease in absolute terms due to the lower number of types in the vaccine. The cost-effectiveness of this strategy is therefore lower at almost €45,000 per QALY. Sensitivity analyses show that this strategy would not be cost-effective even under the most favourable scenarios (assuming a limit of €20,000 per QALY).

Another option would be to increase the indirect protection of older persons against pneumococcal infection by vaccinating children with PCV13, which contains three more vaccine types than the vaccine that is currently used, PCV10. However, the committee does not expect this to benefit older persons significantly. One of the extra types hardly occurs any more in the Netherlands (type 6A), the vaccine is (almost) ineffective against another type in older persons (type 3), and the third additional type provides less indirect protection for older persons than was originally expected (type 19A). In addition, this approach is costly, with costs amounting to over €80,000 per QALY. Sensitivity analyses show that this strategy would not be cost-effective even under the most favourable scenarios (assuming a limit of €20,000 per QALY).

As far as safety is concerned, there is no difference between the various strategies: safety is good in all cases. Known side-effects are almost exclusively mild and short-lived.

Recommendation

The Committee recommends that people aged 60 and over should be offered vaccination against pneumococcal infections with the vaccine PPV23. The first vaccination could take place at 60 years of age, with repeat vaccinations at 65, 70 and 75 years of age. Vaccination with PPV23 would lead to a significant reduction in the mortality rate and disease burden caused by pneumococcal infections, and the associated costs would remain relatively low. The Committee believes that some degree of government intervention is justified in relation to this vaccination. Public

interest is not at stake, because of the absence of outbreaks that could risk societal disruption. However, the Committee does take the view that the vaccination should be regarded as part of essential healthcare (collective interest), for which it is important that the groups for whom protection is most urgent are actually protected. It has reached this conclusion because the utility of the vaccination clearly outweighs its risks. Vaccination reduces the risk of IPD or hospitalisation in cases of pneumococcal pneumonia, and the risk of mortality due to pneumococci, in persons aged 60 years and over. There are practically no risks: the known side-effects are almost exclusively mild and short-lived. In order to ensure that all the essential health benefits are achieved, vaccination must be equally and equitably accessible for all persons aged over 60 years. In the view of the Committee, collective financing is therefore a likely option. The Committee recommends evaluating the pros and cons of a programme-based approach. The Committee takes the view that good provision of information is essential during implementation. It must be made clear that vaccination against pneumococcal infections offers a significant protection, but not a complete protection. This information is important both for the general public and for care providers.

Furthermore, the Committee recommends continuing with the vaccination of children and risk groups in the current way. However, the high-risk group policy could once again be brought to the attention of the relevant care providers.

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Preferred citation:
Health Council of the Netherlands. Pneumococcal vaccination for older persons.
The Hague: Health Council of the Netherlands, 2018; publication no. 2018/05.