Vaccination against meningococcal disease

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Executive summary

Health Council of the Netherlands

Meningococcal disease is a severe infectious disease that can cause meningitis and septicaemia and has a high mortality rate. In a third of the patients, the disease leads to lifelong sequelae such as hearing loss or limb amputation. At the request of the State Secretary for Health, Welfare and Sport, the Committee on Vaccinations of the Health Council has considered whether the current vaccination programme against meningococcal disease in the National Immunisation Programme (NIP) should be revised. The Committee recommends maintaining vaccination of children aged 14 months against meningococcal serogroup C and W, and adding this vaccination to the NIP for children aged 14 years. With respect to meningococcal serogroup B, the Committee recommends not including vaccination in the NIP and reconsidering vaccination when more data are available on the effectiveness of vaccination.

Disease burden

Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. Different meningococcal serogroups can be discerned. Serogroups B and W cause most meningococcal disease in the Netherlands.

Vaccination of children aged 14 months against meningococcal serogroup C (MenC) was introduced into the NIP in 2002 as a response to a MenC outbreak. In addition, an emergency/ catch-up immunization programme against MenC was offered to all children aged 12 months up to and including 18 years. Consequently, MenC currently causes less than ten cases each year. To keep the burden of disease low, vaccination of adolescents was considered by the committee; this can lead to herd immunity as this group has the highest meningococcal carrier rates.

The number of cases caused by meningococcal serogroup W (MenW) has increased in recent years, from 50 in 2016 to 80 in 2017 and 62 in the first half of 2018. The most affected age groups are children younger than 2 years (7 in 2017) and adolescents aged 14 to 24 years (20 in 2017). Notably, a relatively large number of cases is observed among adults aged 45 and over (44 in 2017). Given the severity of the disease, vaccination for these three groups was considered by the committee.

Meningococcal serogroup B (MenB) has caused about 80 cases each year in recent years. Most cases are seen among children younger than 2 years (20 in 2017) and adolescents aged 14 to 24 (26 in 2017). Given the severity of the disease, vaccination for these two groups was considered by the committee.

MenC and MenW vaccination

Two multicomponent conjugate vaccines that protect against meningococcal serogroups A, C, W, and Y (MenACWY vaccines) are available. The MenC vaccination programme in 2002 led to a rapid decline in MenC cases in both vaccinated and unvaccinated children. This

strongly suggests that the MenC vaccination programme has resulted in herd immunity. This effect is expected for MenACWY vaccination as well. To date, evidence for the effectiveness of MenW vaccination is scarce. Recently, an MenW vaccination programme for adolescents was introduced in the national vaccination programme of the United Kingdom, and a catch-up campaign was implemented. This has probably led to stagnation of the previously rapid increase in the number of MenW cases. It is likely that MenW vaccination leads to herd immunity in addition to individual protection, however the extent of this effect remains unclear. The MenACWY vaccines are safe and well-tolerated; the side effects are mild. The Committee considers the risk-benefit ratio of MenACWY vaccination to be favourable: vaccination is acceptable for all age groups. The cost-effectiveness of MenW vaccination is expected to be somewhat higher than the frequently used reference value of €20,000 per quality-adjusted life year (QALY). For MenC vaccination the cost-effectiveness does not have to be considered, as vaccination is aimed at maintaining herd immunity, not at reducing disease.

Continuation of Men C and MenW vaccination for children aged 14 months in the NIP

The Committee recommends continuation of MenC and MenW vaccination for children aged 14 months with a MenACWY vaccine in the NIP, at least for as long as the outbreak of MenW persists. This vaccination meets the criteria from the assessment framework for vaccinations, with the exception of the cost-effectiveness criterion. Nevertheless, the Committee advises continuation of vaccination, given the severity of the disease, the fact that vaccination is already being carried out within the NIP and the fact that the cost-effectiveness ratio is not much higher than the current reference value.

Adding MenC and MenW vaccination for adolescents to the NIP

The Committee recommends adding MenC and MenW vaccination of 14-year-old adolescents with a MenACWY vaccine to the NIP. The vaccination meets all criteria from the assessment framework, with the exception of the cost-effectiveness criterion. Nevertheless, the Committee advises introduction of vaccination, given the seriousness of the disease and the fact that the cost-effectiveness ratio is not much higher than the current reference value. In addition to individual protection against MenW, adolescent vaccination probably leads to a certain degree of herd immunity against this serogroup. In addition, adolescent vaccination with a MenACWY vaccine ensures that herd immunity against MenC is maintained, which keeps the incidence of MenC cases low .

No MenW vaccination programme for (older) adults

The Committee does not recommend the introduction of a MenW vaccination programme for older adults, because there is not enough scientific data available on the efficacy, duration of protection, effectiveness and cost-

effectiveness of vaccination in this group. The Committee recommends performing clinical studies on the efficacy of vaccination in this group.

MenB Vaccination

Two vaccines against multiple MenB strains are available. Both are known to be immunogenic in the short term, but uncertainty exists about long-term immunogenicity. In addition, the effectiveness of MenB vaccination remains unclear. Data from the United Kingdom and Canada suggest that the effectiveness is sufficient, but the uncertainty surrounding these results is large because of the small number of cases. In contrast to MenACWY vaccines, MenB vaccines – which work in a different way – can cause high fever, especially in infants and particularly when administrated with other routine vaccines. In very young children, high fever often leads to hospital admission and medical treatment. In the United Kingdom, MenB vaccination has led to an increase in the number of hospital admissions and medical interventions due to high fever in vaccinated infants, despite the advice to administer prophylactic paracetamol to avoid fever. Due to the uncertainty regarding the effectiveness of MenB vaccination, the Committee is unable to evaluate the risk-benefit ratio. Therefore, acceptability of vaccination could not be evaluated. The cost-effectiveness of MenB vaccination is highly unfavourable compared to the commonly used reference value of €20,000 per QALY.

No MenB vaccination programme in the NIP

Given the evaluation of all criteria, the Committee recommends that MenB vaccination should not be included in the NIP. The Committee recommends reassessing vaccination against MenB when more data on effectiveness are available. The Committee expects that these data will become available in about three years.

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