Supplementary material
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No evidence of clusters of sero-group C meningococcal disease in the Dutch MSM community

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To the Editor

Clusters of invasive meningococcal disease (IMD) among men who have sex with men (MSM) have been reported in Toronto (2001), Chicago (2003), New York (2010-13), Paris (2013), Belgium (2013) and Berlin (2013).\(^1\)\(^-\)\(^6\) All cases occurred in men aged 20-45 years and were caused by *Neisseria meningitidis* serogroup C, sequence type 11 (ST-11). Fine typing of both PorA and FetA was available for the meningococcal isolates in Berlin and Paris and were of PorA-VR1 5-1, PorA-VR2 10-8: FetA F3-6 type. In response, the European centre for Disease Prevention and Control has called for enhanced surveillance and retrospective investigation of serogroup C cases in young men, and to consider targeted vaccination campaigns as a means of outbreak control.\(^7\)

Amsterdam is a popular destination for MSM, hosting the only waterborne gay-pride parade in the world, held on the canals on the first Saturday in August. We hypothesized that similar outbreaks of serogroup C IMD in MSM may have occurred in the Netherlands. Therefore, we retrospectively evaluated the occurrence of serogroup C IMD cases in particular Nm:C:P1.5-1,10-8:F3-6 in the Netherlands in the database of the Netherlands Reference Laboratory for Bacterial Meningitis (NRLBM), with special attention to cases occurring in men aged 20-45. The NRLBM receives meningococcal isolates of more than 90% of IMD patients nationwide.\(^8\)

Between 1960 and 2013, 2610 cases of serogroup C IMD were reported to the NRLBM. Patient age and sex were available for 2430 (93%). The incidence rate increased from 0.05 in 1960 to 1.73 per 100,000 inhabitants in 2001. In response, routine immunization with a serogroup C polysaccharide conjugate vaccine at 14 months and a catch up campaign for children aged 1e19 was initiated in 2002. PorA and FetA fine typing data were available for 69 (91%) of serogroup C cases that occurred from September 2003 to August 2013.

Throughout the observation period of the NRLBM (1960-2013), the proportion of male patients aged 20-45 in all serogroup C cases fluctuated between 0% and 50% per year, with a mean of 9% and a standard deviation (SD) of 7%. The mean proportion per year of woman aged 20-45 was 8% (SD 6%), ranging from 0 to 25%. There were seven years during the observation period in which the proportion of male patients aged 20-45 in all serogroup C cases was more than two standard deviations above the mean yearly proportion. In these seven years no more than four cases per year occurred in men aged 20-45 and there was a minimum of 5 weeks between cases. The Surveillance data of serogroup C cases offer no evidence to suggest that outbreaks of serogroup C disease have previously occurred in Dutch males aged of 20-45.

We subsequently evaluated the occurrence of serogroup C:P1.5-1,10-8:F3-6. In the last decade, 19 (28%) of fully fine typed serogroup C isolates were of P1.5-1,10-8:F3-6 type. Overall, 6 of 19 (32%) cases were male. However, five of the seven (71%) patients in the subgroup of 20e45 year olds were male. These 5 patients lived in different cities and the time interval between cases ranged from 6 weeks to 3 years. All five cases occurred before 2010. From 2010 to 2013, only one patient
with Nm:C:P1.5-1,10-8:F3-6 IMD was identified: a 1-year-old girl. Because of the geographical distribution and time interval between cases, we conclude that there is no evidence that a serogroup C:P1.5-1,10-8:F3-6 IMD epidemic among young males has occurred in the Netherlands.

The Dutch MSM population may be protected from serogroup C meningococcal infections because of the introduction of serogroup C conjugate vaccination in 2002, after which the number of reported cases of serogroup C has declined to around 4-11 cases per year. Because of the concurrent catch-up campaign an estimated 95% of Dutch men up to the age of 30 have presently been vaccinated.

In July 2013 the National Institute of Public Health and the Environment (RIVM) convened a meeting to discuss the reported clusters of IMD among MSM. Because no case of serogroup C IMD had been reported in the Dutch MSM community and because of the high vaccine coverage of young males in the Netherlands, The RIVM made the recommendation to the Ministry of Health, Welfare and Sport (VWS) to take no specific action at this time. MSM over 30 years old who intend to visit a city where outbreaks have been reported with the intention to participate actively in the MSM community are advised to consider vaccination before departure.

Our data show that serogroup C:P1.5-1,10-8:F3-6 has so far spared the MSM community in the Netherlands.
References


4. Haut Conseil de la santé publique. relatif aux recommandations de vaccination contre le méningocoque C au-delà de 24 ans, notamment chez les hommes ayant des relations sexuelles avec d’autres hommes (HSH) http://www.hcsp.fr/Explore.cgi/Telecharger?NomFichier=hcspa20130701_infectionmeningocvaccplus24ans.pdf; 2013. Date last updated: July 01 2013. [Date last accessed 07.10.13].


