Neisseria meningitidis carriage in Swedish teenagers associated with the serogroup W outbreak at the World Scout Jamboree, Japan 2015

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Background

The 23rd World Scout Jamboree (WSJ) organised in Japan 2015 gathered 33,628 participants from 155 countries, including 1,890 Swedish scouts. Directly after their return home three scouts from Scotland and one relative were diagnosed with IMD together with two additional cases within a week later in Sweden (all serogroup W). No additional cases were reported in Europe or Japan.

Material and method

In total, 1,705 samples (cultures n=32, throat swabs n=715, nasopharyngeal swabs n=958) from 1,020 Jamboree participants were collected and sent to the NRL for *N. meningitidis* (Nm) for culture and molecular analysis.

Aim

- To estimate the carrier state of Nm in Swedish teenagers and its association with the WSJ in 2015.
- To compare sensitivity of throat versus nasopharyngeal swab for optimal detection of carriage.

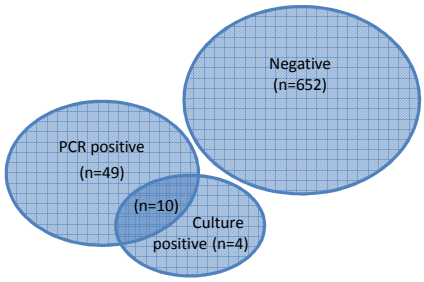

Figure 1. Comparison of traditional culture versus a *ctrA*/*crgA* specific realtime-PCR, for identification of Nm in 715 throat swabs.

Results

Sampling was conducted in 54% of the Swedish participants of the 23rd WSJ, with a mean and modal age of 19 and 15 years, respectively. The overall positivity for Nm was 8%. Two % (n=22, (NmW n=11)) belonged to a known sero/genogroup whereas the majority (n=61) were non-groupable (Table 1).

In 56 individuals both throat and nasopharynx samples were taken (n=112). Nm was detected in both sites in eight individuals, in 46 individuals Nm was only detected in the throat and in two individuals only in the nasopharynx. In addition, sensitivity could be improved about 12-fold by using PCR (Figure 1).

Table 1. Group, age and gender among the 83 Swedish Jamboree participants positive for *Nm* in either culture and/or PCR isolated mainly from throat and/or nasopharynx.

			Gender		Positive	Isolation site, culture			Positive	Isolation site, PCR	
Group	No.	Age	F	M	culture	Throat	Np	Other*/Unk	PCR	Throat	Np
NmW	11	12-52	5	6	11	6	4	2*	6	6	6
NmY	4	17-49	1	3	3	3			2	2	
NmB	4	17-38	-	4	3	2	1		3	1	2
NmC	3	14-19	1	2	2	2			3	3	1
ng	61	13-52	30	31	12	10		2	53	47	7
Total	83	12-52	37	46	31	23	5	4	66	59	16

* blood n=1, sputum n=1, No=number, ng=non-groupable, F=female, M=male, Np=nasopharynx, Unk=unknown

Conclusion

The overall positivity for Nm was 8%; 2% belonged to a known sero/genogroup while the majority were non-groupable.

Throat sample is the sampling method of choice. In addition, sensitivity can be further improved by using PCR, which is more sensitive than culture for identification of asymptomatic carriers.

Carriage studies are important to provide knowledge of the current epidemiology and association between carrier isolates and disease-causing isolates in a given population.

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