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Do smokers have a different Neisserial carriage profile compared with non-smokers? A comparison of socio-behavioural risk factors and carriage of N. meningitidis and N. lactamica

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Background
Smoking is a major risk factor for meningococcal carriage and IMD. It is not known whether smoking predisposes to different meningococcal carriage profile compared with non-smokers. The inflammatory milieu induced by smoking may pre-dispose to carriage of meningococcal isolates expressing the polysaccharide capsule, as a response to harsher environmental conditions in the oropharynx, or altered microbiome. Similarly, smoking may impact on other Neisseria spp. such as N. lactamica, carriage of which is protective against meningococcal carriage. These factors may provide further evidence to aggressively target smoking reduction. We report of the carriage characteristics of smokers vs non-smokers combing two large carriage studies.

Aim/Methods
Carriage isolates and socio-demographic risk factors were used from two UK school carriage studies: baseline carriage from the Be on the TEAM study (ISRCTN 75858406, 2018) and age-matched subset of participants from UKMenCar4 (2014/15). All isolates underwent conventional serogrouping followed by WGS using a standard bioinformatic pipeline and were uploaded to pubMLST.org/neisseria.

Results
A total of 24058 participants were included, with an overall carriage rate of any meningococcus of 5.06%. N. lactamica carriage was 1.07%. The overall smoking rate was 7.89%. Carriage in smokers was 10.9% compared with 4.5% (Odds Ratio 2.6 (95% CI 2.2 – 3.0). Between smokers and non-smokers, there was no difference in carriage of genogroups B (OR 1.2, 0.8 – 2.0), W (OR 1.5, 0.69 – 3.3), and Y (0.93, 0.54 – 1.6) or capsule null (cnl) meningococci (1.16, 0.75 – 1.8). Similarly, there was no difference in carriage of serogroup positive vs negative meningococci between groups (OR 1.07, 0.70 – 1.6). Carriage of N. lactamica did not different between smokers and no smokers (1.06% vs 10.08%, OR 1.05 95% CI 0.67 – 1.65).

Conclusions
Smokers had a 2.5 fold increase in carriage rates compared with non-smokers; however, qualitative carriage and serogroup status did not differ to that of non-smokers. There was no association between N. lactamica carriage and smoking status.