



CrossMark

www.elsevierhealth.com/journals/jinf

Asymptomatic group A Streptococcal throat carriage in Royal Marines recruits and Young Officers

M. Pearson^b, J.L. Fallowfield^c, T. Davey^c, N.M. Thorpe^c, A.J. Allsopp^c, A. Shaw^c, D.R. Wilson^d, S. Sriskandan^{a,b,**}, L.E. Lamb^{a,d,e,*}

 ^a Department of Medicine, Imperial College London, United Kingdom
^b NIHR Health Protection Research Unit in Antimicrobial Resistance and Healthcare Associated Infections, Imperial College London, United Kingdom
^c Institute of Naval Medicine, Crescent Road, Alverstoke, Hampshire, United Kingdom
^d Academic Department of Military Medicine, Royal Centre for Defence Medicine (Research and Academia), Birmingham, United Kingdom
^e Royal Free London NHS Foundation Trust, London, United Kingdom

Accepted 5 March 2017 Available online 23 March 2017

KEYWORDS

Group A Streptococcus; Military; Training; Soft tissue infection; Outbreak; Infection control **Summary** Aims: A prospective observational study was conducted in Royal Marines (RM) recruits to investigate throat carriage of group A Streptococcus (GAS) and incidence of soft tissue infections.

Methods: 1012 RM recruits were followed through a 32-week training programme, with throat swabs being obtained in weeks 1, 6, 15, and 32. Alongside a separate cohort of 46 RM Young Officers (YO) undergoing training were sampled in parallel.

Results: Carriage of *group A Streptococcus* was detected in only 5/1012 (0.49%) recruits at the beginning of training and remained low throughout training. There was no association between GAS carriage and development of soft tissue infection. There was no carriage of GAS in the smaller YO cohort at the start of training, (0/46). At week 6, a surge in GAS carriage was detected in 8/46 (17%) YO, that could be ascribed to a cluster of GAS genotype *emm*83.

Conclusions: Asymptomatic GAS carriage is very infrequent among young adults in England and this should be borne in mind when considering the relevance of a positive throat swab result in

* Corresponding author. Section Infectious Diseases and Immunity, Department of Medicine Imperial College London, London W12 ONN, United Kingdom.

** Corresponding author. NIHR Health Protection Research Unit in Antimicrobial Resistance and Healthcare Associated Infections, Imperial College London, United Kingdom.

E-mail addresses: s.sriskandan@imperial.ac.uk (S. Sriskandan), drlucylamb@gmail.com (L.E. Lamb).

http://dx.doi.org/10.1016/j.jinf.2017.03.001

0163-4453/Crown Copyright © 2017 Published by Elsevier Ltd on behalf of The British Infection Association. All rights reserved.

symptomatic patients or outbreaks. Despite low prevalence, there is however potential for GAS to rapidly and transiently disseminate among adults during outbreaks.

Crown Copyright \circledcirc 2017 Published by Elsevier Ltd on behalf of The British Infection Association. All rights reserved.

Introduction

There are very few studies that quantify asymptomatic throat carriage of group A Streptococcus (GAS) in adults, vet the throat represents the main reservoir for more serious GAS infections¹ and, during outbreaks of invasive GAS disease, throat carriers are often sought. Skin and soft tissue infections (SSTI) account for one third of all admissions to the Medical Centre at the Commando Training Centre Royal Marines (CTCRM), Lympstone, United Kingdom, and account for significant morbidity; 6-10% of those admitted to the medical centre for SSTI require referral to hospital for intravenous antibiotic treatment and 1% require level 3 care.^{2,3} Whilst rarely resulting in a medical discharge or long-term morbidity, SSTI result in a high cost burden for the Ministry of Defence (MOD) due to loss of training time, an increase in back trooping (movement of recruits from one training group, or troop, to another), increased antibiotic use, and increases in Medical Centre admissions, not including hospital admission cost.³ As GAS is one of the most common pathogens responsible for SSTI, better understanding of the reservoirs of GAS in this population is required.

High carriage rates of GAS have previously been linked to disease outbreaks in the US military.^{4–6} For example, Crum et al.⁷ reported a pharyngeal carriage rate of 16% during an GAS *emm*3-associated pneumonia outbreak in 2002. This study therefore set out to determine GAS carriage rates in two military cohorts undergoing training in England, and to determine any association with SSTI.

Methods

Study population

All Royal Marines (RM) recruits, and an additional cohort of Young Officers (YO), who started training between May 2011 and May 2013 were invited to join the study at the start of training. Informed consent for sampling and case note review was obtained from 1012 of 1104 RM recruits and 46 of 55 YOs. The study was approved by the Ministry of Defence Research Ethics Committee (MODREC 172/Gen/ 10). The 1012 consented Royal Marine recruits were divided between 21 troops: The first troop entered training in May 2011 with subsequent troops starting at 2-week intervals up to completion of the study in May 2013. The cohort of 46 consented YOs started a 60 week training programme in Sep 2011. RM recruits are aged 16-32 years, and have passed a basic medical assessment with no minimum gualification requirement for entry, while YOs are aged 18-25 years, medically fit, and have met a required standard in secondary level education and officer training. Although, the RM recruits and YOs were present at the same Centre (Commando Training Centre Royal Marines, CTCRM), training,

housing and catering were in separate locations. The RM recruits were grouped in troops consisting of approximately 40 individuals per troop and housed together for the first 2 weeks of training, then were housed in 6-man rooms. Individual RM recruits slept in single beds separated by a wardrobe. In comparison, the YOs slept in single rooms, although the YOs trained and ate together. The first exercise for each troop and YOs was in week 2 after start of training RM. Throughout training, study participants had contact with people outside their own troop, including other recruits, instructors, civilian and military staff in the Centre (mess halls, gymnasium and medical centre) and during periods of leave when they may return home (certain weekends, Easter (April), August, and Christmas (December).

Sample collection and bacterial isolation

On day 1 of weeks 1, 6, 15 and 32 a nose and throat swab was obtained from each participating RM recruit for bacterial culture. The separate group of YOs were recruited in parallel and sampled on day 1 of weeks 1 (Sep) and 6 (Oct) and 40 (Jun) of their 60-week training programme. The swabs were placed in Amies transport media with charcoal and stored for less than 2 days at 4 °C. The swabs were inoculated onto 5% sheep Columbia blood agar and Streptococcus CNA (colistin and nalidixic acid) plates. The blood agar plates were incubated anaerobically and the Streptococcus plates aerobically at 37 °C. Plates were examined at 24 h for typical growth and then re-incubated for a further 24 h if no evidence of GAS. If typical GAS colonies were seen then a Gram stain was performed. If Gram-positive cocci were observed then a catalase test performed and if negative a PathoDx Streptococcus A latex agglutination test. A carrier was defined by at least one GAS colony being identified. Isolates underwent antimicrobial susceptibility testing and *emm* type determination.

Antimicrobial susceptibility testing

Antimicrobial susceptibility testing was carried out in accordance with European Committee on Antimicrobial Susceptibility Testing (EUCAST) disc diffusion methods.⁸ All susceptibilities were called in reference to EUCAST breakpoint tables.

Emm typing

Bacterial DNA was extracted as previously described by Pospiech et al.⁹ *Emm* typing was carried out in accordance with the Centers for Disease Control and Prevention (CDC) *emm* typing PCR protocol using the sequencing primer *emms*eq2 — TATTCGCTTAGAAAATTAAAAACAGG.¹⁰ Sequenced amplicons were then blasted against the CDC database to determine specific *emm* type. Download English Version:

https://daneshyari.com/en/article/5668596

Download Persian Version:

https://daneshyari.com/article/5668596

Daneshyari.com