

Notes from the Field: Response to Serogroup B

Meningococcal Disease Among Military

Trainees — Texas, April 2021

Author List

Joseph E. Marcus, MD¹; William N. Bennett V, MD¹; Dianne N. Frankel, DO²; John W. Kieffer, MD³; Theresa M. Casey, DVM³; Amanda E. Huston, MPH⁴; Courtney N. Hintz, MD⁵; Alexander P. Keller IV, MD⁵; Michael T. Smolka, DO⁵; Cynthia S Sikorski, MD⁶; Matthew J. Dolan, MD¹; John L. Kiley, MD¹

¹ Infectious Disease Service, Brooke Army Medical Center, Joint Base San Antonio;

² Office of the Command Surgeon, Air Education and Training Command, Joint Base San Antonio-Randolph

³ Trainee Health Surveillance, 559 THLS, Joint Base San Antonio-Lackland;

⁴ Public Health, 559 AMDS, Joint Base San Antonio-Lackland

⁵ Special Warfare Human Performance Support Group, Joint Base San Antonio-Lackland

⁶ Naval Health Research Center, San Diego

Corresponding author: Joseph Marcus, joseph.e.marcus3.mil@mail.mil, 210-916-5554

On April 4, 2021, a 21 year old military special warfare trainee who was in the pre-dive school component of training presented to sick call with headache, neck stiffness, myalgia, vomiting, and purpura on his trunk, extremities, and his soft palate. He had a lumbar puncture performed with a

neutrophilic pleocytosis (5,348 WBC/microliter, 85% polymorphonuclear leukocytes), hypoglycorrhachia (<2 mg/dL), elevated protein (312 mg/dL), Gram stain with gram-negative diplococci, and a polymerase chain reaction positivity for *Neisseria meningitidis*. He was isolated from his training unit and started on intravenous ceftriaxone. The patient's sample from his spinal fluid grew *N. meningitidis* which whole genome sequencing classified as serogroup B. The patient was treated with intravenous ceftriaxone and returned to training after completion of therapy.

Special warfare training is a technical school in the United States Air Force with unique demands including underwater training. All trainees are vaccinated with a quadrivalent meningococcal vaccine against serotypes A, C, W, and Y. All trainees live in double occupancy rooms. At the time of this patient's presentation, his training group of 70 students was in an underwater component of training, which involved repeated episodes of "buddy breathing," where trainees simulate limited resources in an operational environment by sharing a common air supply between multiple divers.

At the time of diagnosis, public health, preventive medicine, trainee health, and infectious diseases responses were coordinated, and exposed trainees were quarantined. As there was significant sharing of breathing equipment between the trainees, all 70 individuals who were in diving school received prophylaxis with ciprofloxacin, except for the patient's roommate who received ceftriaxone. The patient's training group underwent daily screening for symptoms of headache, neck pain, fever, or purpura. Five trainees including the patient's roommate had one or more of these symptoms, underwent lumbar puncture, and showed no evidence of bacterial meningitis. As there were no additional cases in the 3 month period following the single source patient, this event did not meet criteria for an organization-based outbreak (1), and the decision was made not to vaccinate against meningitis B.

Meningococcal disease has historically caused significant morbidity and mortality in congregate settings,

but has significantly decreased with the introduction of the quadrivalent meningococcal vaccine (2). Despite quadrivalent meningococcal vaccine requirements, serogroup B outbreaks have occurred amongst university students, where nasal carriage is more commonly seen than in the general population (3). As serogroup B vaccination has not been associated with decreased nasal carriage of *N. meningitidis*, there is unknown benefit of vaccination outside of an outbreak setting (4).

This report describes a successful response to a case of serogroup B meningococcal disease in special warfare trainees who were utilizing diver “buddy breathing,” a possible route of transmission in this case. With post exposure prophylaxis, isolation of source patient, and surveillance for other trainees, there were no additional cases of meningococcal disease following this high-risk exposure.

References

- (1) CDC. Guidance for Evaluation and Public Health Management of Suspected Outbreaks of Meningococcal Disease. Version 2.0, September 28, 2019
- (2) Broderick MP, Faix DJ, Hansen CJ, Blair PJ. Trends in meningococcal disease in the United States military, 1971-2010. *Emerg Infect Dis.* 2012;18(9):1430-1437. doi:10.3201/eid1809.120257
- (3) Soeters HM, McNamara LA, Whaley M, et al. Serogroup B Meningococcal Disease Outbreak and Carriage Evaluation at a College - Rhode Island, 2015. *MMWR Morb Mortal Wkly Rep.* 2015;64(22):606-607.
- (4) Marshall HS, McMillan M, Koehler AP, et al. Meningococcal B Vaccine and Meningococcal Carriage in Adolescents in Australia. *N Engl J Med.* 2020;382(4):318-327. doi:10.1056/NEJMoa1900236

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