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ABSTRACT

Using laboratory and medical encounter records to identify impact of prophylaxis policies on group A Streptococcus in three recruit training facilities

TM Luse, K Shannon, and G Nowak

EpiData Center Division, Navy and Marine Corps Public Health Center, Portsmouth, VA, USA
E-mail: tina.luse@med.navy.mil

Objective
To compare trends of group A beta-hemolytic Streptococcus among recruits before and after changes in prophylaxis implementation using electronic laboratory and medical encounter records.

Introduction
Group A beta-hemolytic Streptococcus (GABHS) has caused outbreaks in recruit training environments, where it leads to significant morbidity and, on occasion, has been linked to deaths.[1,2] Streptococcal surveillance has long been a part of military recruit public health activities. All Navy and Marine Corps training sites are required to track and record positive throat cultures and rapid tests on weekly basis. The Navy and Marine Corps have used bicillin prophylaxis as an effective control measure against GABHS outbreaks at recruit training sites.[3] Though streptococcal control program policies vary by site, a minimum prophylaxis protocol is required and mass prophylax is indicated when local GABHS rates exceed a specific threshold. Before July 2007, prophylaxis upon initial entry was required between October and March, and when the local rate exceeded 10 cases per 1000 recruits. In July 2007, the Navy instituted a policy of mass prophylaxis upon initial entry throughout the year. Evaluation of GABHS cases before and after implementation of the new policy, including overall rates, identification of outbreaks, and inpatient results will help enhance the Navy's ability to evaluate threshold levels, provide systematic/standardized monitoring across the three recruit sites, and inform prophylaxis and monitoring strategies.

Methods
Positive GABHS laboratory results were identified from the Health Level 7 chemistry and microbiology databases from 1 May 2004 through 31 December 2009 for all Navy and Marine Corps recruits. Laboratory results included cultures and rapid strep tests. Positive laboratory test results were matched on specimen collection dates to inpatient and outpatient clinical encounter records using ICD-9 codes. The top diagnoses among GABHS cases were identified. Using these most frequent diagnoses associated with strep positive labs, inpatient and outpatient encounter records during the study timeframe were identified for all recruits with GABHS-like illness, regardless of laboratory test result. Weekly GABHS rates were calculated for laboratory positive cases and GABHS-like diagnosis for each recruit training site. Weekly trends were compared with prophylaxis regimens for each training site.

Results
There were 5576 laboratory-identified cases of GABHS in Navy and Marine Corps recruits between May 2004 and December 2009. Almost half of all cases (47%, $n = 2596$) occurred at one of the three recruit training sites. Comparisons of illness rates before and after implementation of the new policy showed a substantial decrease in rates at all three training facilities. In 2008 and 2009, rates of illness each week rarely exceeded two cases per 1000 individuals and never exceeded four cases per 1000 individuals. Large peaks in cases were identified often before 2007, but have not occurred since 2008. A total of 200,914 outpatient records were identified with GABHS-like illnesses. Close to 60 percent of all outpatient encounters occurred at one of the three training sites ($n = 118{,}043$). Volume of cases was substantially lower after implementation of prophylaxis policies.

Conclusion
Identifying cases of GABHS using electronic laboratory and medical encounter records can assist in determining whether prophylaxis policies are effective. Evaluation of the data has shown a substantial decrease in rates of cases among recruits after the implementation of the new policy in 2007.

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