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Preventive Medicine
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Overview

- Characterize respiratory morbidity during Basic Cadet Training (BCT) at US Air Force Academy (USAFA)
- Summarize research during BCT 2009
- Share recent experience with nH1N1 outbreak at USAFA
- Highlight opportunities for further understanding of respiratory illnesses and nH1N1 via data collected during BCT 2009
Basic Cadet Training (BCT)

- Basic Training for approximately 1500 cadets
  - High levels of mental and physical stress
  - Phase 1: Academic/military training on main campus
  - Phase 2: Field training in Jacks Valley
- “Jacks’ Hack”: Lay term for a variety of respiratory ailments that occur during field training
<table>
<thead>
<tr>
<th>Year</th>
<th>Respiratory visits in Jacks Valley</th>
<th>Respiratory visits during BCT</th>
<th>% of visits occurring in Jacks Valley</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>426</td>
<td>807</td>
<td>53%</td>
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<tr>
<td>2008</td>
<td>380</td>
<td>755</td>
<td>50%</td>
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Objectives
- Rule out adenovirus as cause of “Jacks’ Hack”
- Rule out other pathogens as causative/associative
- Evaluate possible associated risk factors

Time period: 25 Jun - 14 Aug 2009

Inclusion criteria
- Cadet aged 18 and above
- 2009 BCT participant
- Presents for care at cadet clinic or infirmary tent
Subjects

- Group 1: Febrile Respiratory Illness (FRI Group)
  - Cough / sore throat
  - Oral temperature of 100.5 F or greater

- Group 2: Afebrile Respiratory Illness Group
  - Cough / sore throat
  - Oral temperature of less than 100.5 F

- Group 3: Control Group
  - Any other complaint (e.g. musculoskeletal, skin)
Methods

- Questionnaire completed
- Clinical exam documented
- Throat swab and nasal wash obtained
- Specimens shipped to Advanced Diagnostic Laboratory (ADL) at Lackland AFB, TX
Pathogens Tested

- Adenovirus
  - Universal and 3, 4, 7, 14, 21
- Influenza A (subtyped) & B
- Parainfluenza types 1, 2, 3
- Rhinovirus
- Coronavirus
  - HCoV229E and HCoOC43
- Respiratory syncytial virus
- Human metapneumovirus
- Epstein Barr Virus

- Bocavirus
- Strep pneumonia
- Strep pyogenes
- Mycoplasma pneumonia
- Chlamydia pneumonia
- Bordetella pertussis I
- Bordetella pertussis II
- Legionella pneumophila
- Haemophilus influenza
- Neisseria meningitides
Respiratory Illnesses
BCT 2009

March to Jacks Valley
March out of Jacks Valley

No. of Respiratory Visits per Day

Day of BCT
Novel Influenza A (H1N1)
BCT 2009
Preliminary Results

- Adenovirus not etiologic agent
- Rhinovirus most commonly identified pathogen
- Bordetella species (non-Pertussis) identified in a number of individuals
- Influenza A/H1N1 identified in early specimens
- Influenza A/H1N1 identified in some subjects who did not meet CDC criteria for influenza-like illness
Outbreak recognized 2 days after July 4 event

4th of July event

Endemic transmission state?

Date of Symptom Onset

No. Cases

U.S. AIR FORCE

Integrity - Service - Excellence
July 4th “Mixing Bowl”
Opportunities from H1N1 Outbreak

- Share lessons learned from containing an outbreak
  - Large training/university setting

- Highlight involvement of non-medical participation

- Utilize experience for planning
  - Screening protocols
  - Preventive measures
  - Rapid response

- Analyze data from serial shedding study

Integrity - Service - Excellence
Shedding Duration

- Subset of isolated cadets
  - Serial nasal wash performed
  - Documented temperature at repeat sampling
  - Documented first date asymptomatic

- Samples tested by rRT PCR; if positive, then cultured
  - (+) on culture = evidence of viable virus shedding

- Analyze shedding duration relative to
  - Symptom onset, resolution, defervescence
  - Oseltamivir treatment factored into analysis
In Summary

- Typical respiratory morbidity during BCT 2009 confounded by nH1N1 outbreak

- Adenovirus not an etiologic factor in Jacks’ Hack during BCT 2009

- Rhinovirus most commonly identified virus in patients with respiratory illness who did not have H1N1

- nH1N1 outbreak at USAFA provided a unique opportunity to better understand shedding of H1N1