Complications of Bordetella Pertussis in the Adult Population

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Abstract
Adults infected with Bordetella pertussis often present atypical to the familiar presentation observed in the pediatric population. By the time the patient reaches an otolaryngologist, the cough has been unresponsive to attempted therapies. Diagnosis of this process is often reassuring to the patient and prevents unnecessary treatments or tests. Study Design: Case series. Methods: Retrospective chart review with accompanying literature review. Results: Three patients were referred to the otolaryngology service for chronic cough with associated laryngospasm. Two of these patients had prior laryngopharyngeal reflux which seems to have been exacerbated by the coughing. One patient’s symptoms were so severe that she required a tracheotomy due to recurrent severe laryngospasm. Diagnosis was achieved with Bordetella pertussis antibody detection. Conclusions: Bordetella pertussis is a self-limiting process which should be on the differential of persistent cough. Diagnosis can be elicited by history and serology. If diagnosed early, patients may be treated with a course of antibiotics. Subsequently, however, patients may be treated symptomatically until the disease is cleared.

Introduction:
"Whooping cough", or Pertussis, is classically thought of as a disease of the young, but should be thought of a potential cause of chronic cough in adults. This is especially important given a resurgence1 of this disease process in previously vaccinated adults and adolescents as immunity wanes. In the adult population the process is usually a self-limited course, however serious complications can arise. We present here three cases of complicated Pertussis infections.

Case Presentation #1:
RS is a 67 year old man who presented to the otolaryngology clinic with a history of 7-10 coughing episodes per day over the past two weeks. These episodes are paroxysmal and so severe that he will go into laryngospasm, characterized by difficulty with breathing for 30-60 seconds and accompanied by “funny breathing sounds”. The patient has a brother and sister with a similar cough. He has been treated with Azithromycin and cough suppressants. Physical exam, including fiberoptic laryngoscopy, was normal. Serology for Bordetella pertussis was positive. The patient gradually had improvement of his symptoms to resolution after 5 months.

Case Presentation #2:
FR is a 74 year old man was referred to otolaryngology with 7 weeks of intermittent severe coughing episodes. These coughing episodes were accompanied by a high-pitched inspiratory stridor. The patient had already been treated with Azithromycin for this. Additionally, he now complains of a globus sensation and frequent throat-clearing. Fiberoptic laryngoscopy demonstrated posterior glottic erythema and edema along with posterior glottic cobblestoning consistent with laryngopharyngeal reflux. Serology for Bordetella pertussis was positive. He was treated symptomatically with a proton pump inhibitor and had near resolution of his cough and laryngospasm by 4 months.

Case Presentation #3:
AR is a 65 year old woman who suffered multiple episodes of coughing fits that led to severe laryngospasm, requiring multiple hospital admissions. Serology for Bordetella pertussis was positive. Given her severe protracted course and lack of response to supportive care, the decision was made to provide the patient with a tracheotomy to bypass the laryngospasm.

Discussion:
"Whooping cough", or Pertussis, is an infection of the respiratory tract caused by Bordetella pertussis, a small Gram-negative cocccobacillus. It is highly infectious and kills close to 300,000 people world-wide per year3. The incidence in the US has been rising to the point that there have been 27,550 cases reported in 2010. It is classically divided into 3 stages as described in table 1. The presentation in the adult population is different from those in childhood. The characteristic whoop that occurs after paroxysmal bouts of coughing is recognized in only 20%-40% of adults with whooping cough. Antibiotics are effective early (<3-4 weeks) in the disease and help prevent transmission. However, people are usually diagnosed later in the process, in the paroxysmal stage. The immunization recommendations for adults include: a dose of Tdap (diphtheria and reduced tetanus toxoids and acellular pertussis) to all adults aged 19-64, and those >65 if they are to come into close contact with an infant5. The vaccination for persons aged 19-64 is currently at 8.2% in 20106. Of utmost importance is the prevention of spread of this disease to infants, for whom this disease can be fatal.

Table 1: Stages of Pertussis infection2

<table>
<thead>
<tr>
<th>Stage</th>
<th>Length (range)</th>
<th>Clinical Features</th>
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<tbody>
<tr>
<td>1. Cattaral</td>
<td>7-10 days (range of 4-21)</td>
<td>Coryza, low-grade fever, mild cough which progresses</td>
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<tr>
<td>2. Paroxysmal</td>
<td>1-6 weeks (but may persist up to 10 weeks)</td>
<td>Paroxysms or rapid coughs, long inspiratory with high-pitched “whoop” at the end of the paroxysms, cyanosis, Occur frequently at night</td>
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<tr>
<td>3. Convalescent</td>
<td>7-10 days (range 4-21)</td>
<td>Gradual recovery, less persistent coughing episodes</td>
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Conclusion:
Whooping cough, once thought to be a disease of the young, is now making a resurgence. Early detection and treatment is necessary to prevent complications from the disease, and more importantly, prevention of spread to those more vulnerable. Up to date immunization is key.

Bibliography:
1. S.W. Roush, T.V. Murphy, Vaccine-Preventable Disease Table Working Group Historical comparisons of morbidity and mortality for vaccine-preventable diseases in the United States