Dealing with the upsurge in whooping cough

New vaccine recommendations have been issued to deal with the current outbreak of pertussis, writes Brenda Corcoran

PERTUSSIS IS A CYCLICAL DISEASE whose incidence peaks every three to four years. As of the first week in December, 2012, 437 pertussis (whooping cough) cases had been reported across the country this year. This is double the number of cases reported in 2011.

Infants less than six months of age have been most affected by this serious disease with resulting hospitalisation, and two deaths have occurred in this age group in the current outbreak. Many cases have also been reported in adolescents and adults. Other industrialised countries such as Australia, Canada, the UK and US are also seeing large-scale outbreaks – the US has reported more than 34,000 cases with 16 deaths so far this year.

Infected PERTUSSIS is caused by the bacteria Bordetella pertussis and is highly infectious. Following an incubation period (5-10 days), catarhal symptoms develop for one to two weeks. During this time, coughing paroxysms start leading to the characteristic ‘whoop’. The cough lasting from one to six weeks is typically worse at night and may lead to vomiting. The catarhal, paroxysmal and convalescent stages may last several months, which is why the disease is often known as the ‘100-day cough’.

Infection in young infants may cause choking or apnoea without cough and this group is at highest risk of severe complications such as pneumonia and seizures. In adolescents and adults the disease may be mild with the only symptom being a persistent cough. Studies have shown that up to a third of adults and adolescents with a cough lasting longer than two weeks have pertussis.

Transmission

Transmission occurs by droplet infection and in the absence of appropriate antibiotic treatment, cases are most infectious in the first three weeks of disease, with a secondary attack rate of up to 90% among non-immune household contacts. Adults and adolescents are a significant source of transmission to unvaccinated young infants, either as household or close contacts or as healthcare workers transmitting the disease to vulnerable groups.

Diagnosis

Laboratory diagnosis of pertussis is difficult and in most cases, outside of the hospital setting, the diagnosis has to be made on clinical presentation.

Treatment

Erythromycin, clarithromycin, azithromycin and co-trimoxazole can be used for treatment and prophylaxis of pertussis. All cases of pertussis should be notified to departments of public health who will provide advice on the need for prophylaxis in individual cases.

Vaccination

From the 1950s, whole cell pertussis vaccines were used to prevent disease. These vaccines were highly immunogenic but resulted in frequent local side effects and fever. Following worldwide safety concerns, acellular pertussis vaccines were developed. However, while the acellular vaccines have better safety profiles, there is now evidence that the immunity produced is not as long lasting and the immune response may not be as good. There is also evidence of genetic changes in the pathogen towards vaccine resistant strains, although whether this leads to increased disease susceptibility and outbreaks remains unclear.

Pertussis vaccination or previous infection does not confer lifelong immunity. Immunity wanes over time, so people can be reinfected and spread the infection to others. Current pertussis vaccines provide good short term immunity but require boosting. As a result, it is vital that pertussis vaccination is given in accordance with the national schedule to ensure children (especially infants) gain the most timely benefit.

New recommendations for pertussis vaccination in Ireland

In response to the current outbreak, the National Immunisation Advisory Commission has issued new recommendations for pertussis vaccination of pregnant women and cocooning (ie. vaccinating everyone in close contact with an infant too young for vaccination) of preterm infants to protect those who are too young to be fully vaccinated:

- Pregnant women who have not received a pertussis-containing vaccine within the previous 10 years should now be offered Tdap (Boostrix) vaccine between 28-32 weeks gestation. The timing of the vaccination has been changed to enable protection of the very young infant via the maximum transfer of maternal antibodies and is in line with recent recommendations from the US and the UK.
- Tdap may be offered to women later in pregnancy or to unvaccinated women in the week after delivery, although this may be less effective
- Tdap should be offered to close family contacts of infants born before 32 weeks gestation as they may not have received protection via maternal immunisation. This includes: siblings in the household who should have all
age-appropriate vaccinations including Tdap at 11-14 years; and older adolescents and adults who have not received a pertussis-containing vaccine in the previous 10 years who should be offered Tdap ideally two weeks before beginning close contact with the infant.  

Routine

Five doses of pertussis-containing vaccines are recommended routinely for children (see Table 1).

Healthcare workers

Pertussis vaccination of healthcare staff has recently been recommended for those in contact with infants, pregnant women and the immunocompromised, which includes all general practice staff. There has been documented pertussis transmission from healthcare workers to patients, and healthcare workers are exposed to pertussis much more frequently than the number of diagnosed cases suggests.

Cocooning

Cocooning – vaccinating everyone in close contact with an infant too young for vaccination, to prevent them coming into contact with pertussis – is now recommended and should be considered in a community outbreak or for premature babies.

Disease control

To control the current outbreak there are immediate actions that should be taken:

- Vaccinate all children on time (especially from families who have just had or are expecting a new baby)
- Vaccinate all general practice staff
- Offer pertussis vaccine to pregnant women (28-30 weeks), close family contacts and pre-term infants
- Encourage other adults to have booster vaccinations
- Consider the possibility of pertussis in patients with a suspicious persistent cough
- Advise pregnant women and mothers and their young babies to avoid people with a cough until their child has had their second dose of vaccine at four months of age. There has been a significant increase in pertussis cases in Ireland. Increased awareness and appropriate child and adult vaccination are essential to reduce the associated morbidity and mortality and to control this disease.

References


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Vaccine Preventable/ Pertussis Whooping Cough

Table 1

<table>
<thead>
<tr>
<th>Pertussis containing vaccines and indications</th>
<th>Vaccine</th>
<th>Product name</th>
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</thead>
<tbody>
<tr>
<td>2, 4, 6 months</td>
<td>6 in 1</td>
<td>Infanrix Hexa</td>
</tr>
<tr>
<td>4-5 years (junior infants)</td>
<td>4 in 1</td>
<td>Infanrix IPV</td>
</tr>
<tr>
<td>11-14 years (1st year)</td>
<td>Tdap*</td>
<td>Boostrix</td>
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<tr>
<td>GP practice staff and other healthcare workers</td>
<td>Tdap*</td>
<td>Boostrix</td>
</tr>
<tr>
<td>28-32 weeks gestation</td>
<td>Tdap*</td>
<td>Boostrix</td>
</tr>
<tr>
<td>Adults</td>
<td>Tdap*</td>
<td>Boostrix</td>
</tr>
<tr>
<td>Close family contacts</td>
<td>Tdap*</td>
<td>Boostrix</td>
</tr>
</tbody>
</table>

Low dose pertussis vaccine (Tdap) is given to those aged 10 years and older to reduce local adverse reactions. Tdap should be given regardless of the interval since the last tetanus or diphtheria toxoid containing vaccine.