

Pertussis - Whooping Cough

The Clinical Picture

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Definition

An acute, highly contagious, infectious disease of the respiratory tract with a characteristic cough.

Epidemiology

According to World Health Organization data, 50 million people worldwide contract pertussis each year, and approximately 400,000 die of it. In Germany, where reporting is not required by law, it is estimated that 80,000 cases occur annually, with 6% to 10% occurring in infants, 40% in children between the ages of 1 and 4 years, 45% in 5- to 9-year-olds, and 5% in 10- to 14-year-olds. Most cases, therefore, appear in young children. Girls are more frequently affected than boys.

Pertussis is more prevalent during colder seasons, with an increase in the number of cases occurring every three or four years. Vaccination programs have reduced the incidence of pertussis in industrialized nations. Adults, in whom the course of the disease is often atypical, may constitute an important source of infection.

Etiology

Bordetella pertussis is a rod-shaped encapsulated bacterium; human beings are its only host. The airborne germs can be transmitted a considerable distance by coughing. The incubation period is 7 to 14 days.

Symptoms

The early, *catarrhal* stage of the illness lasts approximately 10 to 14 days and is characterized by conjunctival infection, sneezing, and rhinorrhea. The subsequent *paroxysmal* stage usually begins with an atypical cough building to a paroxysmal

cough (staccato cough), followed by crowing inspiration caused by spasmodic laryngeal contraction ("whooping") and vomiting of tough phlegm. Up to 50 attacks of coughing may occur in 24 hours. The attacks frequently occur at night, disturbing the sleep of the child and his/her caregiver. As shown in Table 1, symptoms in patients younger than six months are less typical than those in older children.

The attacks of coughing persist for four to six weeks and are accompanied by temperatures from 38.4°C to 38.8°C (101.1°F to 101.8°F). Paroxysmal coughing may cause subconjunctival bleeding or ulceration of the lingual frenulum. After four to six weeks, the cough gradually subsides (convalescent stage), usually ending within an additional two to four weeks. Pertussoid coughing recurs in many children whenever they contract a minor upper respiratory tract infection (coughing tic).

In adults, the cough is often not staccato-like. Prodromes involving inflammation of the mucosae are observed in nearly half of adult cases, but laryngeal spasms, vomiting, fever, and nocturnal coughing are infrequent.

Complications

The most frequent complications are pneumonia (due to pneumococcal superinfections) and bacterial otitis. Apnea re-

quiring artificial respiration is an acute life-threatening complication in infants, in whom convulsions and pertussal encephalopathy are also serious complications. Mortality is higher during the first year of life than in older children (Table 2). Permanent brain damage develops during or after pertussis at a rate of 1:100. Vaccination reduces brain damage to 1:1-20 million cases of the illness. In many cases, complications are due to failure to vaccinate or inadequate immunization (which is effective only after the third vaccination at age 5 months).

Complications of pertussis are significantly more frequent in the elderly, resulting in high mortality from pneumonia in this age group.

Diagnosis

The hemogram reveals leukocytosis with 60% to 80% lymphocytes. Isolates can be cultured from a nasopharyngeal specimen. Specific antibodies appear in the serum in the course of the disease—specific IgA confirms the active disease, while IgM and IgG appear after both vaccination and illness.

Differential diagnosis

Pertussis-like symptoms can also be due to infection with *Bordetella parapertussis*, respiratory syncytial virus, influenza vi-

| | < 6 months | 6-12 months | 1-6 years | 6-18 years |
|---------------------|------------|-------------|-----------|------------|
| Paroxysmal coughing | 33% | 76% | 80% | 79% |
| Cough | 34% | 80% | 73% | 63% |
| Nocturnal cough | 14% | 32% | 40% | 49% |
| Vomiting | 24% | 54% | 55% | 55% |
| Laryngeal spasms | 16% | 33% | 40% | 38% |
| Fever | 12% | 22% | 13% | 8% |

Table 1: Symptoms of whooping cough in childhood and adolescence [7].

| Age | Pneumonia | Apnea | Convulsions | Encephalopathy | Cases of death | Total |
|-------------|-----------|-------|-------------|----------------|----------------|-------|
| 0-5 months | 65 | 34 | 13 | 13 | 2 | 127 |
| 6-12 months | 15 | 3 | 3 | 1 | 0 | 22 |
| 1-4 years | 53 | 4 | 10 | 4 | 0 | 71 |
| 5-9 years | 19 | 0 | 1 | 2 | 1 | 23 |
| > 9 years | 9 | 0 | 1 | 1 | 1 | 12 |
| N | 161 | 41 | 28 | 21 | 4 | 255 |
| % | 63.1 | 16.1 | 11.0 | 8.2 | 1.6 | 100.0 |

Table 2: Complications in pertussis cases [1].

ruses, or *Mycoplasma pneumoniae*. In infants and small children, the possibility of a foreign body lodged in the respiratory tract should also be considered.

Prophylaxis

The method of choice is immunization with acellular vaccine. Immunity to pertussis persists for approximately 15 to 20 years after proper vaccination, the same as after contracting the illness. Whole-germ vaccines are no longer used due to high rates of complication. Specific hyperimmunoglobulins appear to be ineffective.

Therapy

With conventional treatment, erythromycin eradicates the bacteria from the nose and throat within 7 days but does not reduce the severity of clinical symptoms over the course of the illness. In serious cases, the illness can sometimes be mitigated by administering corticosteroids.

Cough suppression is an important part of therapy. Cough suppressors such as codeine, dextromethorphan hydrobromide, and noscipine can be used but are not very effective. Mucolytics are prescribed to loosen tough phlegm. Sedatives are seldom effective. Foods and fluids are given more frequently; eating after an attack of coughing lessens the danger of aspiration of food.

Homeopathic therapy can be implemented using *Drosera* 4X, *Coccus cacti* 4X, *Ipecacuanha* 4X, *Belladonna* 12X, *Cuprum*

arsenicum 4X, *Mephitis putorius* 6X, and *Arnica* 4X.

For phytotherapy for coughing, *Thymus vulgaris* (*Thymi herba*, tincture of thyme 1:10, fluid extract) is suitable because of its secretolytic, secretomotoric, and spasmolytic properties. *Drosera rotundifolia* (Sundew) has spasmolytic, anti-inflammatory, and antibiotic properties. *Hedera helix* (Ivy) has spasmolytic, secretolytic, and mild sedative effects. *Petasites hybridus* (Butterbur) is also sometimes used as a spasmolytic.

Basic antihomotoxic therapy consists of a combination of the preparations *Drosera-Homaccord*[®] (primary remedy), *Tartephedreel*, and *Husteel*. Of *Drosera-Homaccord*[®]'s two ingredients, *Drosera* is suited to treating respiratory tract infections, especially whooping cough, while *Cuprum aceticum* should be used in cases of asthma and whooping cough for its antispasmodic effect. *Tartephedreel* is a homeopathic combination preparation for use in inflammatory respiratory illnesses involving dyspnea. *Husteel* is a gentle cough suppressant and spasmolytic. Children up to the age of 4 years are given one third of the adult dosage (10 drops 3 times a day). Children between the ages of 4 and 8 years receive half of the adult dose, while those from ages 8 to 12 years receive two thirds.

The preparation *Atropinum compositum* is a powerful spasmolytic that can be used in severe cases. When symptoms are less pronounced, *Dropterteel*[®] tablets are a suitable adjuvant to therapy; they should con-

tinue to be administered for a while after acute symptoms have subsided. The preparation *Spascupreel*[®], also a suitable antispasmodic, is used primarily in the form of suppositories. Restlessness due to fever is best treated with *Viburcol*[®] suppositories, a formula with both sedative and antispasmodic effects. Children with pertussis often vomit swallowed phlegm. The nausea can sometimes be so excruciating that *Vomitusheel*[®] suppositories are indicated. When coughing attacks persist longer than the acute symptoms and a protracted convalescence is anticipated, *Pertussis-Nosode* should be administered to speed the elimination of deposited toxins.

References

1. ESPED-Jahresbericht 1995. Komplikationen von Pertussis-Erkrankungen (1993 Nov - 1995 Dez). *Monatsschr Kinderheilkd.* 1996;144:967-973.
2. Haidvogel M. *Homöopathie für Kinderärzte*. Stuttgart, Germany: Enke; 1997.
3. Liese JGM, Hoppe E, Stefans G, et al. Pertussisdiagnostik durch Erregerisolierung mittels Direktausstrich von Nasopharyngealabstrichen. *Monatsschr Kinderheilkd.* 1994;142:967-970.
4. Quast U, Ley S. Was Ihre Patienten wissen wollen: die häufigsten Fragen zu Impfungen. Sonderheft Impfen. *Kinderärztliche Praxis.* 1998;69:41-46.
5. Weiss RF, Fintelmann V. *Lehrbuch der Phytotherapie*. Stuttgart, Germany: Hippokrates; 1997.
6. Wemmer U. Impfkonzepete im Wandel der Zeit. *Biol Med.* 1998;27:123-127.
7. Wirsing von König CH. Keuchhusten: Mikrobiologie, Epidemiologie, Prophylaxe. *Die Gelben Hefte.* 1993;33:80-86.

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