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The General Practice Management of Whooping Cough

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The presence of a paroxysmal cough (with whoop or terminating respiratory stridor) means that bronchial infection with *Bordetella pertussis, parapertussis* or *bronchiseptica* is likely; only rarely are other conditions such as adenovirus infection (types 2, 5 or 12), cystic fibrosis, bronchial foreign body, or tuberculosis of mediastinal lymph nodes the cause of the syndrome. The absence of a paroxysmal whooping cough however, does not eliminate the diagnosis of Bordetella infection in young infants, who rarely demonstrate the 'machine gun-like' coughing spasm followed by a massive inspiration. Rather, they have incomplete coughing spasms, ending in apnoea.

1. Diagnosis

The diagnosis of whooping cough will usually be relatively simple, as it is an epidemic disease (mostly of pre-schoolers) and often more than one child in a family has the symptoms — though immunisation affects both the incidence of cross-infection and the severity of the symptoms. Post-nasal swabs reveal the organism in the early catarrhal stages of the disease, if plated directly onto special media. However, this is not the sort of test which can be readily performed in the home or surgery. Additionally, the test is of little help once the paroxysmal coughing stage has developed. Nevertheless despite these limitations, cultures are of value in detecting the organism in sibling contacts of a putative case, particularly if they have coryzal symptoms. Antibacterial treatment (e.g. with erythromycin or ampicillin) of siblings who have been identified as being infected, may be effective in preventing the development of the paroxysmal phase if given in the very early phase of the disease.

Cultures for adenovirus, although likely to establish the presence or absence of this virus, are of little practical importance, as there is no specific means by which the virus can be treated or infection prevented in other family members, apart from isolation of the infected child. In this context, it has been recently recognised that manual transfer of infective nasopharyngeal secretions is the most common mode of transmission of respiratory infections, rather than transmission by airborne droplets.

The absolute lymphocyte count in Bordetella infections is usually considerably raised by the time paroxysmal cough has developed, and thus can be a helpful quick-test.

2. Treatment of The Individual

2.1 Antibiotic Therapy

Antibiotics are of little use in the paroxysmal coughing stage, except to prevent secondary bacterial pneumonia. The choice of antibiotic is not therefore dictated by the sensitivity of *B. pertussis*, but rather the organisms likely to cause secondary pneumonia in young children. For this reason, chloramphenicol — probably the most reliable antibiotic active against *B. pertussis* — is not indicated, whereas ampicillin, to which *B. pertussis* is variably sensitive, may be. In the opinion of some, erythromycin is the best antibiotic, as it has been suggested that this drug may also reduce contagiousness.

2.2 General Measures

General measures such as isolation from the rest of the family, a warm moist atmosphere in the bedroom at night, and frequent small feedings are most important. Cough suppressants are surprisingly ineffective, and oversedation, particularly with codeine-type drugs should be avoided. Codeine or its analogues should not be prescribed for children under the age of one in any event.

Extracts from *B. pertussis* have been known for many years to cause blockade of β_2 adrenergic receptors in the bronchial tree, and a recent study[1] has indicated that a β_2 adrenergic stimulant (salbutamol) lessens paroxysms of coughing. This report needs confirmation as other organisms (e.g. respiratory syncytial virus; RSV) also cause such blockade, without producing paroxysmal cough. The wheeze produced by RSV is notoriously resistant to β_2 adrenergic stimulants.

In areas where tuberculosis is still not rare, a routine Heaf test should be performed, as quiescent primary foci may become active during pertussis.

1. Badr-El-Din et al.: J. Trop. Med. Hyg. 79: 218-219 (1976).

Table I. Summary of the management of whooping cough in general practice

1. *Diagnosis* — based on:
   a) Presence of epidemic
   b) Clinical picture
   c) Lymphocytosis
   If condition presents atypically, consider other diseases — e.g. bronchial foreign body (chest X-ray indicated), cystic fibrosis (perform sweat test), tuberculosis of mediastinal lymph nodes (perform Heaf test)
2. *Treatment of the individual*
   a) General measures — isolate from rest of family; warm moist atmosphere in bedroom; small frequent meals
   b) Antibiotics to prevent secondary pneumonia (e.g. erythromycin, ampicillin)
   c) Transfer to hospital if choking spells occur in infants
   d) If complications present (e.g. asphyxia, convulsions), give emergency treatment and transfer immediately to hospital
3. *Treatment of contacts*
   a) Take post-nasal swabs
   b) Give booster injection if already immunised; prophylactic antibiotics (e.g. erythromycin, ampicillin) indicated if Bordetella organisms recovered from post-nasal swabs
   c) Give prophylactic antibiotics if < 3 months or unimmunised
4. *Prophylaxis saves lives*

2.3 When to Transfer to Hospital

The young infant with pertussis is most at risk, and if apnoeic or choking turns have occurred, transfer to a hospital unit with around-the-clock paediatric facilities is indicated. Deaths from whooping cough occur only in children under two, and the use of IV alimentation, oxygen therapy, etc. can eliminate most fatal outcomes in this group.

Complications such as asphyxia, convulsions (with or without intracranial haemorrhage, pneumomediastum, and pneumonia) must be recognised, but apart from emergency measures, a child with these complications requires urgent admission to an expert paediatric unit.

2.4 Possibility of Other Diseases

Whooping cough presenting atypically such as in the absence of an epidemic, with paroxysmal coughing starting in the daytime, or preceded by failure to thrive, should raise the possibilities of other diseases referred to previously, and should be an indication for expiratory chest X-ray (foreign body), sweat test (cystic fibrosis), or Heaf test (tuberculosis).

3. Treatment of Other Members of the Family at Risk

3.1 Infants and Young Children

Infants and toddlers in contact with the primary case if already immunised should receive a booster injection. A post-nasal swab should be taken, and if the organism is recovered, a course of the antibiotic indicated by *in vitro* sensitivity (usually erythromycin or ampicillin) given. Hyperimmune antipertussis γ-globulin may be given (2.5ml by IM injection) but this measure is of unproven value.

3.2 Newborn Infants

Unfortunately, immunity is not passively transferred from the mother to the newborn infant, and as immunisations are not started until three months of age, the under three month old is particularly susceptible to infection. Because of the high mortality at this age, young babies in contact with whooping cough should probably receive prophylactic antibiotics, whether or not the organism is recovered from the baby or other members of the family.

3.3 Role of Immunisation

Needless to say, immunisation is the keystone of prophylaxis. In the US mortality from whooping cough in 1900 was 309 per 100,000 infants but this declined to 1.6 per 100,000 infants in 1960, probably mainly as a result of immunisation campaigns. Unimmunised infants still run a possible risk of about 0.3% of death from whooping cough. It appears that vaccines available in the UK in the 1960's may not have been very effective, as they were not appropriate for the current serotypes in the community. However, this defect has been rectified, and with this improvement, scepticism about the value of the vaccine is not warranted.

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