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Whooping cough in adults

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Abstract

During the 1970s whooping cough returned in Sweden after an absence of more than 10 years and is now seen in all age groups. During a three-year period 174 adults with culture-verified whooping cough were identified in Gothenburg. Most of the patients had typical symptoms with whooping attacks and often vomiting. The disease was long lasting but complications were rare.

Physicians should be aware that whooping cough may occur in adults, since adults may be an important source of infection for infants and erythromycin given in the catarrhal phase may modify the clinical course.

Introduction

A pertussis vaccine giving 90% immunity was introduced in Sweden during the late 1940s.[1] From the early 1960s about 90% of all infants were vaccinated and pertussis became rare. In the first years of the 1970s whooping cough returned, and since 1974 the disease has been endemic. The return of the disease seems to have been related to changes in production of the vaccine at the beginning of the decade.[2]

In 1978, 5140 bacteriologically verified cases of pertussis were reported to the National Bacteriological Laboratory, Stockholm. Investigation of a subsample showed that out of 620 children aged 1-6 years with the disease, 521 (84%) had received three injections of pertussis vaccine. Another investigation disclosed that 84% of 38 015 preschool children born during 1974-8 in various regions of Sweden had been given three injections of pertussis vaccine (Epidemiological Department, National Bacteriological Laboratory, Stockholm, unpublished data). Since the Swedish-made pertussis vaccine evidently lacked protective effect, vaccination was stopped in 1979. When whooping cough returned many adults also contracted the disease.

Patients, methods, and results

During 1976-8 *Bordetella pertussis* was isolated from 3488 patients at the Department of Clinical Bacteriology, Gothenburg, which serves a population of just over half a million. This report is based on interviews with all patients aged 20 years and over with culture-verified whooping cough.

Bord pertussis was isolated from 174 adults (51 men, 123 women). Their median age was 35 years, and the range 20-81. Six patients were over 60. Twenty-three patients were certain that they had been immunised against whooping cough in childhood during the 1950s. Many patients under 30 had no information about immunisation in childhood but may also have been immunised. Forty-one patients, evenly distributed in the different age groups, claimed with certainty that they had had whooping cough as children.

Ten patients had underlying diseases (five cardiovascular, two rheumatoid arthritis, one diabetes mellitus, one renal insufficiency, one epilepsy). Three women were delivered and one became pregnant during active pertussis. Another nine women were pregnant in the second to eighth months.

Most of the patients had had a prolonged illness with whooping attacks and often vomiting (table) but complications were rare. Two

Clinical course of whooping cough in 174 adults (percentages in parentheses)

	Late or no erythromycin treatment (n = 155)	Early erythromycin treatment (within four days of onset of symptoms) (n = 19)
Severity according to patient's estimation:		
Mild	24 (15·5)	15 (78·9)
Moderate	57 (36·8)	2 (10·5)
Severe	74 (47·7)	2 (10·5)
Whooping attacks	127 (81·9)	2 (10·5)
Vomiting	78 (50·3)	2 (10·5)
Median duration of symptoms in weeks; range	8; 2-26	2; 1-10

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patients had sustained rib fractures, one a small pneumothorax, and one slight bronchopneumonia. Only three patients were admitted to hospital, and all for less than one week. Of 134 patients in employment, 87 had to stay at home during the whooping stage, usually for two to four weeks. Twenty-two patients were unable to work for more than one month.

The severity of the disease could not be related to age, sex, immunisation, or a history of whooping cough in childhood. One patient with angina pectoris had a prolonged illness with severe whooping attacks causing angina and dyspnoea. Other underlying conditions did not seem to influence the severity of the disease. Pregnant women did did not have more severe disease than non-pregnant women. Two women had normal deliveries without complications, and a third had an uncomplicated caesarean section during active pertussis.

Erythromycin given within four days of onset of catarrhal symptoms was the only factor that seemed to influence the severity of the disease. Most of the 19 patients treated in this way had the disease for less than two weeks, without whooping attacks. Eighty patients had been given erythromycin after the fourth day. There were no indications that this affected either the symptoms or the duration of the disease.

Of the 174 patients, 28 worked in hospitals or other health services; among these were two young doctors and three nurses who worked in a children's health centre, an infant ward, and an intensive care unit in a children's hospital. Twenty-five other patients worked in direct contact with children. Two of the patients working in hospitals and 11 working in schools and nurseries had been infected at work. A total of 114 patients had been infected by their children or grandchildren. The source of the disease was known in another 23 cases and unknown in 24.

Twenty-one patients claimed to have spread the disease to other persons, usually family members, including one newborn infant. Another six infants were exposed by their parents but received erythromycin prophylaxis and escaped the disease.

Discussion

The 174 patients with culture-verified pertussis detected in Gothenburg during 1976-8 probably represented only a small proportion of all adult cases in Gothenburg. For example, one patient in the series was the only person to be submitted for nasopharyngeal culture during an epidemic of clinical whooping cough in a large office. The smaller proportion of men in the series also indicates that many cases may have been missed. Many mothers sought medical help with their children and were sampled for culture, whereas the coughing fathers were not examined. A small sex difference might be expected, however, since mothers at home would be more easily infected by their children and more women work in the health and child care services.

Before pertussis vaccination was introduced whooping cough in adults was very uncommon. Only rarely was the disease seen twice in the same person.[3 4] The good immunity in adults may have been due to repeated natural booster doses through exposure to the disease. When whooping cough returns to a population after a long absence adults immunised against the disease by previous active disease or vaccination may have lost their immunity and contract the disease again.

Clinical whooping cough in childhood does not exclude reinfection as an adult, as shown in this series (64 of our 174 cases) and elsewhere.[5 6] Nevertheless, since corresponding data from a relevant control group are lacking no other conclusions can be drawn concerning long-lasting protection from active disease or immunisation.

Some reviews have emphasised the difficulty of diagnosing whooping cough in adults because of the atypical clinical course.[7 8] In contrast, but in agreement with other studies,[6 9] most of the patients presented here had had typical symptoms, with whooping attacks and often vomiting. The most important diagnostic factor is probably recognising that the disease may occur in adults.

Though all of the patients recovered, only a few were admitted to hospital, and complications were rare, the consequences of the disease in adults are not negligible: the disease was usually prolonged, half of the patients felt "severely ill," and many working days were lost.

The only way to modify the clinical course of pertussis is apparently to give erythromycin in the catarrhal stage. Early erythromycin treatment resulted in abortive disease, of short duration, and without whooping attacks in 17 out of 19 patients. We do not know, however, whether abortive disease after erythromycin confers immunity. Thus erythromycin might merely postpone the disease until the next exposure. After the catarrhal stage erythromycin is indicated only to decrease contagiousness in order to protect newborn infants or other sensitive people. In many of the 80 patients given this antibiotic during the whooping stage it was probably not indicated. As in all antibiotic treatment, overuse of the drug may lead to unfavourable changes in the microbial flora and in the sensitivity pattern of pathogenic micro-organisms.

Adults with pertussis must also be recognised as an important source of spread of infection. Children may be infected by their parents[9] and patients by hospital staff.[10-12] The only means of preventing spread when isolation is not possible is to give erythromycin to all exposed persons and patients with active disease. With this regimen the disease was prevented in six exposed newborn infants. The importance of giving erythromycin on such wide indications is exemplified by a family in which the sister, mother, grandmother, and great-grandfather of a new-born child all had clinical and culture-verified disease when the child was born.

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ENDIVE. Common garden Endive bears a longer and larger leaf than Succory, and abides but one year, quickly running up to a stalk and seed, and then perishes; it has blue flowers, and the seed of the ordinary Endive is so like Succory seed, that it is hard to distinguish them.

It is a fine cooling, cleansing, jovial plant. The decoction of the leaves, or the juice, or the distilled water of Endive, serve well to cool the excessive heat of the liver and stomach, and in the hot fits of agues, and all other inflammations in any part of the body; it cools the heat and sharpness of the urine, and excoriation in the urinary parts. The seeds are of the same property, or rather more powerful, and besides are available for fainting, swoonings, and passions of the heart. Outwardly applied, they serve to temper the sharp humours of fretting ulcers, hot tumours, swellings, and pestilential sores; and wonderfully help not only the redness and inflammations of the eyes, but the dimness of the sight also; they are also used to allay the pains of the gout. You cannot use it amiss; a syrup of it is a fine cooling medicine for fevers. (Nicholas Culpeper (1616-54) *The Complete Herbal*, 1850.)