

Psittacosis in general practice: implications for control

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SUMMARY. *In one general practice over a six-week period three patients with atypical pneumonia were shown serologically to have psittacosis. All three patients had been exposed to the same flock of ducks but veterinary investigation three months after the first case had been reported did not show the ducks to be infected. However, in a retrospective review of laboratory-diagnosed psittacosis, a likely source of infection was found in 11 out of 24 cases and in most of these full medicoveterinary investigation would have been warranted. Early diagnosis, reporting quickly to the medical officer for environmental health and early liaison with the divisional veterinary officer are essential prerequisites if psittacosis is to be controlled. If psittacosis were made a statutory notifiable disease this would encourage a more energetic approach to its control. The proposed cut-backs in the veterinary investigation service will make full investigations more difficult.*

Introduction

Psittacosis (ornithosis), infection with *Chlamydia psittaci*, is one of the more common causes of atypical pneumonia and pyrexia of unknown origin seen in general practice, and it may be preventable. Epidemiological data suggest that the incidence of psittacosis in the UK has increased considerably over the last few years,¹ and in Norway in 1981, there was a seven-fold increase compared with previous years.² However, in only a few cases is a likely source of infection identified and often even a full local investigation does not reveal a source. For example, of 14 consecutive patients with psittacosis seen in one general practice, a history of contact with birds was obtained for only two of these patients.³ This has led to the suggestion that direct person-to-person transmission may be more frequent than was thought.⁴

Sources of infection and modes of transmission are often clarified by the investigation of outbreaks or clusters of cases. Such studies have led to the identification of psittacosis as an occupational hazard in the duck industry in the UK and have highlighted the possible risks from inadequately processed feathers and down.⁵ The investigation which followed the identification of a cluster of three cases of psittacosis in one general practice is reported here.

Practice and patients

The practice is in a semi-rural area and has a population of 5250. During December 1983 and January 1984 three patients presented with the signs and symptoms of a localized chest infection. These patients failed to improve when treated with broad spectrum antibiotics, expectorants and bronchodilators. Serological screening was carried out at the Public Health

© *Journal of the Royal College of General Practitioners*, 1985, 35, 413-415.

Laboratory Service (PHLS), Cardiff. In each case routine complement fixation tests using the chlamydial group antigen indicated chlamydial infection. The patients were given courses of tetracycline antibiotics and they then made gradual but full recoveries.

The first case was a woman aged 33 years. She presented on 10 December 1983 with a two-week history of headaches followed by a cough with purulent sputum. She had also suffered from intermittent fever and shortness of breath for three weeks. She looked generally unwell and had numerous fine crepitations in the lower lobe of the left lung. A serum sample taken on 22 December 1983 had a complement fixation test titre of 1/512.

The second case was an 11-year-old boy. He presented on 6 January 1984 with a history of a sore throat for 10 days with associated pyrexia, followed a few days later by wheeziness and a cough with purulent sputum. Examination revealed scattered rhonchi in both lung fields with coarse crepitations in the left lower lobe. A serum sample taken on 13 January 1984 had a complement fixation test titre of more than 1/512. This patient was absent from school for six weeks.

The third case was also an 11-year-old boy. He presented on 23 January 1984 complaining of wheeziness and a cough with purulent sputum both of several days duration. Examination showed fine crepitations in the base of the left lung. A serum sample taken on 26 January 1984 had a complement fixation test titre of 1/512.

All three patients had a past medical history which included frequent chest infections and a tendency to have bronchospasm. They also all had a personal or family history of eczema. All three would therefore be classified as atopic individuals.

Investigation

Detailed interviews with the three index patients were undertaken. A veterinary investigation to find a possible common source of infection for these three cases was carried out by the Divisional Veterinary Officer (Veterinary Investigation), Cardiff.

In addition case finding was carried out by a retrospective review of all surgery consultations from 3 January to 20 February 1984. Patients who had presented with a history of pyrexia of unknown origin or any respiratory illness lasting for seven days or more after first consultation were identified and an attempt was made to obtain serum samples for routine virological screening.

A retrospective review was also carried out of patients found to have significant complement fixation test titres to the chlamydial group antigen by the PHLS, Cardiff between January 1983 and March 1984. The general practitioners of these patients were contacted and permission was sought to contact the patients directly. Where possible patients were interviewed in person or by telephone.

Results

Possible sources of infection for the three index cases

The only potential source of infection which was identified for the female patient was a flock of ducks owned by a neighbour. These ducks often perched on the neighbour's garden wall and in a narrow lane through which the patient walked twice daily.

The two boys were in the same class at school but onset of symptoms in the earlier case occurred during the school

Christmas holidays when there was no contact between them. The first boy to present did not return to school before the second boy became ill. Both boys often, but independently, walked their dogs around the village on a route which took them into the lane where the female case lived and past the flock of ducks. This exposure to the flock of ducks was the only factor common to the three cases that could be identified.

Veterinary investigation of the ducks

The ducks posed a possible public health hazard. Therefore, on 8 March 1984, the Divisional Veterinary Officer at the Cardiff Veterinary Investigation Centre, with the assistance of environmental health officers, took cloacal swabs from 16 ducks, eye swabs from 13 ducks and blood samples from six ducks. However, they found no indications of recent illness in the ducks. No chlamydia were cultured and all the serum samples showed antibody titres against the chlamydial group antigen of less than 1/10.

Practice consultations

In the period from 3 January to 20 February 1984 1050 patients made 1430 consultations. Of these patients 41 (4%) were asked to attend for blood samples to be taken. One patient refused, two did not keep their appointment, eight did not reply and in two cases venepuncture was unsuccessful. Of the blood samples from the remaining 28 patients only one showed raised chlamydia antibody titres (1/32). Blood samples from five patients showed serological evidence of other recent viral infections, adenovirus (two patients, both 1/32), influenza B (1/256 and 1/64), and respiratory syncytial virus (1/64). One patient had glandular fever.

Laboratory identified cases

In the 15 months which were reviewed, 37 patients, including the three index patients, were found to have significant complement fixation test titres greater than or equal to 1/64. Thirty-one patients living in Cardiff, the Vale of Glamorgan and Gwent were followed up and histories were obtained from 24 of these.

Twenty patients including the three index cases had single convalescent titres greater than or equal to 1/128 and may be considered to be confirmed cases of psittacosis. Two patients kept pigeons and one patient regularly visited a pet shop and had contact with a neighbour's parrot. One patient managed an equipment hire shop and customers included farmers from the index practice area and also builders working in that area. One patient, though having no known direct contact with birds, visited the index practice area each week. One patient became ill two weeks after visiting a zoo where she spent time in the aviary. On further enquiry it was discovered that psittacosis had been diagnosed in a pigeon at the zoo three months earlier. One patient was exposed to pigeon droppings as a result of workmen cleaning pipes outside her office window.

Eleven patients had complement fixation test titres of 1/64 and two of these patients lived near the index practice area. Two other patients were probably infected while on holiday in Spain. One patient owned exotic birds and another patient acquired a budgerigar one month before her illness and the budgerigar subsequently became ill but was not examined. Another patient owned and worked in a pet shop where two parrots died of psittacosis one month before she became ill.

In summary, 11 (46%) of the 24 patients from whom a history was obtained had a known contact with birds which were likely to have been the source of infection.

Discussion

Chlamydia psittaci may be transmitted by both ill and well birds in faecal droppings and in conjunctival and nasal secretions. The organism survives on feathers or in dust, and human infection usually occurs via respiration. Mammals such as sheep and cats may also be infected with *C. psittaci* and it has been suggested that they may transmit the organism.⁶ However, the significance of this is uncertain. The organism may be spread from person to person and this route of transmission may have been under-emphasized in the past.^{2,4}

Psittacosis can cause a prolonged debilitating respiratory illness, as was the case for the three index patients. However, it may produce only mild influenza-like symptoms and therefore may often go unrecognized. Of the 28 patients with prolonged (more than seven days) respiratory illness reviewed retrospectively by convalescent serology only one patient had evidence of recent exposure to chlamydia. However psittacosis is not always associated with raised complement fixation test antibodies³ and more sensitive and specific serological tests are needed. Early diagnosis and appropriate treatment will therefore depend on suspicion combined with good history taking.

It may be significant that the three index patients were atopic individuals with a tendency to have bronchospasm. However, an association between atopy and psittacosis has not been noted previously in the literature. Possibly such individuals are more likely to present to their general practitioner and the practitioner may be more likely to investigate such cases serologically.

In most cases of psittacosis reported by laboratories to the PHLS Communicable Disease Surveillance Centre (CDSC), a source of infection is not recorded. For example, in 1983 a possible source was recorded for only 53 (15%) of the 362 cases reported. Of these 53 possible sources, parrots (15), budgerigars (6), parakeets (2), canaries (1), finches (1), and cockatoos (1) made up 49%; pigeons (8) 15% and poultry (5) 9% (unpublished CDSC data). Our retrospective survey produced better results; a possible source was identified for 46% of the patients from whom a history was obtained. In several of these cases, had the history been known at the time of diagnosis, a full investigation might have been justified to prevent possible further cases. This would have been particularly relevant in the case of the patient who visited a zoo and in the case of the patient who owned a pet shop since in both these cases the general public may have been exposed to the sources of infection.

In order for prompt public health measures to be taken, general practitioners need to be aware of the significance of psittacosis to public health. Awareness of the possible sources of psittacosis will help in initial diagnosis, and confirmed or suspected cases, with a good history of exposure to birds, should be reported immediately to the medical officer for environmental health. If psittacosis were made a statutory notifiable disease this would highlight the fact that this infection can be controlled and would stimulate appreciation of the significance of a history of exposure to birds. It would also encourage public health specialists to pursue investigation and control more vigorously.⁷

The investigation reported here was made possible by the collaboration of general practitioners, community physicians, environmental health officers and veterinarians and such an approach is essential to the control of zoonoses.⁸ Particularly important is close liaison between the medical officer for environmental health and the divisional veterinary officer. In this study a potential source of infection was identified, but possibly because the flock of ducks was investigated three months after the index cases were infected microbiological evidence did not prove the association. Had the ducks shown evidence of infection tetracycline treatment or slaughter would have been warranted. At the very least the investigation proved that collaborative field investigations are possible if resources are available. The proposed cuts in the number of veterinary investigation centres would severely curtail such public health investigations.

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Acknowledgements

We thank Dr A. Evans and Dr J. Munro, PHLS, Cardiff; Dr Pat Jenkins, Medical Officer for Environmental Health, Cardiff; Dr Brian Deere, Medical Officer for Environmental Health, Gwent; Mr T. Morgan, Divisional Veterinary Officer, Cardiff and environmental health and general practitioner colleagues. Veterinary samples were examined at the Central Veterinary Laboratory, Weybridge.

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Autism — biochemical findings

Succinyladenosine and succinylaminoimidazole carboxamide riboside were found in body fluids from three children, including a brother and sister, with severe psychomotor delay and autism. Both succinylpurines were identified by acid hydrolysis, anion-exchange chromatography, and ultraviolet spectrophotometry. Concentrations of both compounds were around $100 \mu\text{mol l}^{-1}$ in cerebrospinal fluid, between 5 and $10 \mu\text{mol l}^{-1}$ in plasma, and in the mmol l^{-1} range in urine. Succinylpurines were undetectable in cerebrospinal fluid and plasma from controls but there might be trace amounts in normal urine. The compounds are dephosphorylated derivatives of the intracellular metabolites adenylosuccinate and succinylaminoimidazole carboxamide ribotide, the two substrates of adenylosuccinase (adenylosuccinate lyase, EC4.3.2.2). Their presence indicates a deficiency of this enzyme, which is involved in both *de novo* synthesis of purines and the formation of adenosine monophosphate from inosine monophosphate. Assays in one patient revealed markedly decreased adenylosuccinase activity in the liver and absence of activity in the kidney. The accumulation of both succinylpurines in the cerebrospinal fluid suggests that there is also a deficiency of this enzyme in the brain and that it may be the basic defect in a subgroup of children with genetically determined autism.

Source: Jacken J, Van den Berghe G. An infantile autistic syndrome characterised by the presence of succinylpurines in body fluids. *Lancet* 1984; **2**: 1058.

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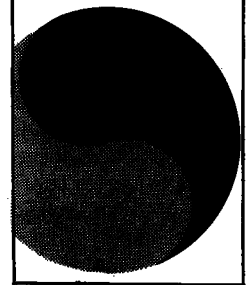
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