

CLINICAL REFLECTIONS ON PARROTS, PSITTACOSIS AND HYPERSENSITIVITY PNEUMONITIS

By Dr Roger K.A. Allen

A Rare Bird

One afternoon about ten years ago, my plumber, who is a good friend of mine, rang to tell me he was very sick and his doctor was doing tests to see if his weight loss was due to cancer. He'd even had a colonoscopy. He had felt dreadful for a few weeks with severe weight loss. He came over to my place in his work clothes and when I examined him I thought he had pneumonia although he had very few respiratory symptoms. I asked what he had been doing lately and he told me he had been repairing the roofing at a local girls' school and had removed a lot of birds' nests and droppings from the roof, to the extent that it filled a 44 gallon drum. "Ah", I thought, "he has psittacosis from the pigeon droppings". I prescribed an appropriate antibiotic, ordered some blood tests and a chest x-ray and my suspicions were proved correct. He regained his weight, felt well and the sweats settled. I have not seen a case of psittacosis since and have rarely seen this as a chest physician over the past thirty years.

When most people think about avian diseases they think about psittacosis which is an infection and quite different from bird fancier's lung (hypersensitivity pneumonitis) which is an allergic reaction involving antibodies and lymphocytes. However it is not the same sort of allergy as asthma, or hayfever which are mediated by mast cells and IgE antibodies. Bird fancier's lung involves IgG antibodies (immune complex) or type III hypersensitivity and cell mediated immunity (type IV hypersensitivity).

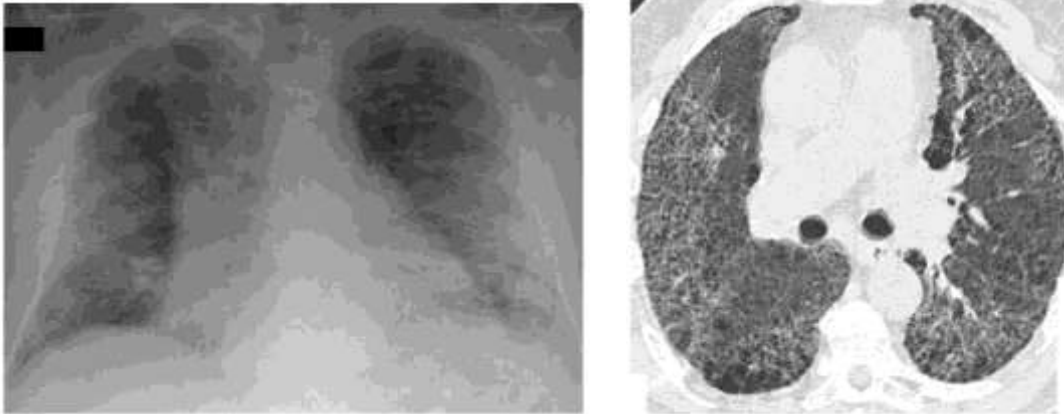
Psittacosis on the other hand is an infection caused by *Chlamydophila psittaci*, and although commonly associated with parrots (Ancient Greek, ψίττακος a parrot), the condition is found world-wide and found in 460 species and 30 bird orders, even ostriches and penguins as well as poultry including ducks. As *Chlamydophila* (formerly *Chlamydia*) is a bacteria which lives inside human cells (most bacteria survive outside), it thus susceptible to only certain antibiotics e.g. tetracyclines and macrolides. Space does not permit elaboration.

Only One Canary

The first description of hypersensitivity pneumonitis was in Sweden in 1555 by O Magnus who described "a disease of sifters and threshers of grain" which was mediated by the grain protein.

When I was training in thoracic/chest medicine, I saw an old female patient who presented with chronic breathlessness and a dry cough. Her chest x-ray showed shadows in her upper lobes suggestive of an extrinsic allergic alveolitis typical of bird fancier's lung. This brought home to me the secret of diagnosis is to think of the possibility and then everything hangs on the history. She had one pet canary she was very fond of and this one bird was the cause.

Extrinsic Allergic Alveolitis or Hypersensitivity Pneumonitis (HP) – various causes



In my training I saw a few patients with mushroom worker's lung, and some from using a lot of bagged compost containing countless fungi and bacteria, among which was *Thermophilic actinomyces* which is responsible for farmer's lung.

Sugar cane mulch or bagasse causes bagassosis rarely, washing powder production can cause a similar reaction in workers exposed to enzymes in the powder (from *Bacillus subtilis*). There is a long list of causes of extrinsic allergic alveolitis or HP which is in essence, an attack on the lungs by the immune system reacting to foreign proteins entering the body by the portal of the lungs. It is as if there is a war going on in the lungs as the body comes in contact with the enemy. The result is that the lung is damaged in the process and at worst; permanent damage to the lungs by fibrous tissue (scar tissue) as scarring is the end product of any chronic inflammatory reaction. Not only do the alveoli become affected but also the smaller airways or bronchioles with the deposition of immune complexes, inflammatory cells and granulomata which are clumps of immune cells (lymphocytes and macrophages).

With this perspective in mind, bird fancier's lung should be seen as just one manifestation of this process with bird proteins being the trigger in certain unlucky individuals. The birds I have seen most commonly associated with this condition are pigeons although parrots and even canaries clearly can be associated with this. Poultry does not incite this reaction. In the last few years I have seen a few cases is another manifestation of HP called "hot-tub lung" from micro-organisms growing in the warm water which becomes aerosolised with the bubbling spa.

A typical case

Typically the patient, usually a middle-aged man, presents with a dry cough and breathlessness and often recounts how, after cleaning out the pigeon loft of droppings and straw, he feels unwell about six hours later with a dry cough, fever and malaise. They have usually been breeding birds or pigeon racing for several years. They may have lost weight and complain of poor appetite and feeling lethargic.

Investigations

When I was a young trainee doctor we used serological tests for bird fancier's lung. These classically showed precipitating antibodies in the patient's serum i.e. the patient's serum when placed in a small well on a Petrie dish with agar where there is an adjacent well of bird serum. When the two serums (human and avian) diffuse in the agar they eventually meet and cause a precipitating line if the patient has developed antibodies which are specifically anti-avian and thus bind to the bird allergen and leave a line or front. This technique is called radial diffusion and done on an Ouchterlony plate.

However, these days we also use more sophisticated techniques called ELISA to diagnose the antibodies but the principal is the same. In addition, if cells are harvested from the lung of the sufferer, there is an increase in CD8 T-lymphocytes (suppressor cells). It is not uncommon however for bird fanciers to have antibodies to their birds without having bird fancier's lung. Equally, it is possible to have HP with no antibodies detected (about 10-15%). What triggers the disease in susceptible people is not clearly known but it probably related to the individual's ability to over-react more than others as the lung disease is not beneficial but an unfortunate over-reaction. Ironically, cigarette smoking is somewhat protective in HP but this clearly is not indicated as an avoidance strategy.

The upper lobes of the lungs may be affected more because on inspiration the air goes into the upper lobes first. CT scans show this beautifully. On lung function testing we find the lungs become smaller and stiffer and with reduced ability to take up oxygen. We measure this by a technique called diffusing capacity which uses an inhaled gas mixture of low concentration of carbon monoxide and helium.

Treatment

The treatment of bird fancier's lung is to remove the exposure to the birds, and wait for a slow improvement. Sometimes oral corticosteroids are used such as prednisolone which dampens down the inflammation. If the disease has been chronic, permanent lung damage can occur and this can seriously affect health and at worse, reduce life-expectancy.

Prevention

Prevention of this condition is not simple but keeping lofts and aviaries clean and hosing down walls and floors rather than sweeping up dust and dry droppings. Birds also give off a dust from their feathers so this also is a potential source of allergen. Masks may help (on the human, not the bird).

I have seen some pigeon fanciers who have failed to improve only to find they have not got rid of all their birds but kept a few cherished favourites, thinking that a few birds would be safe. As the condition can be insidious sometimes, it begs the question of whether any surveillance for this condition is needed. A serological test and lung function tests would be

an easy way of assessing this problem, perhaps every year in a person who has continued avian exposure. I would be interested in exploring this possibility of a trial to see if the condition is more prevalent than we think; perhaps food for thought.

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