

# Ornithosis in peninsular Malaysia (In Man and Pigeons)

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## INTRODUCTION

ORNITHOSIS or psittacosis, as the disease is called in psittacine birds, is a zoonotic disease and usually presents itself as an influenza-like illness with a sudden onset of fever, pains in back and limbs and a severe headache after an incubation period of about 10 days. Many cases are mild or even subclinical. The severe cases show signs of pneumonic involvement towards the end of the first week. There is usually a dissociation between the pulse rate and the temperature, and a rising pulse rate of over a hundred in the second week indicates poor prognosis. In severe cases, a typhoid state develops in the second week but in patients who are going to recover, the temperature falls by lysis towards the end of the second week. Coma, a rising pulse rate and cyanosis usually precedes death.

Man gets infected with ornithosis through handling infected birds, inhaling air-borne dried infected droppings or bite wounds. However, many people have antibodies in their sera which cannot readily be accounted for. Transmission can also be from person to person (Hansen & Sorensen, 1955) and some nurses tending to infected patients have been known to contract the disease from their patients. Middle-aged or older people appear to be more highly exposed to the infection, being more likely to acquire birds as pets and to spend more time in closed households with their birds, especially

during the winter seasons. The susceptibility to ornithosis/psittacosis, however, is much the same for both sexes and all age groups although the mortality rate may be higher in the very young and the aged. In the outbreaks of 1929-30, the case fatality rate was nearly 20%, but since the advent of the antimicrobial drugs it has fallen to 0.5% with early diagnosis and treatment.

The causal agent of ornithosis is *not* a virus but is classified with the rickettsiae as an intracellular parasite descending from bacterial ancestors; it is, therefore, a bacterium. It represents a member of a family of organisms which shares a common antigen which is called the Psittacosis-Lymphogranuloma Venerium (P-LGV) agents. Some refer to them as *Bedsoniae*, after Sir Samuel Bedson, whose studies of these organisms form the basis of present-day knowledge. Being bacteria, the agents are susceptible to antibiotics, especially the tetracycline group, aureomycin in particular.

## HISTORY AND EPIDEMIOLOGY

Psittacosis was first recognized in Switzerland in 1879 by Ritter who described an outbreak in a household in Ulster in which were kept exotic birds. Further outbreaks in the next 20 years were described in Germany, Italy, Switzerland and France. In 1929 and 1930, extensive epidemics occurred in 12 European countries involving about 800 persons. The main source of the infection was found to be parrots shipped from South America (Meyer, 1942). Imported exotic birds were not the only source of infection, however, because in Australia psittacosis was found also among psittacine birds living in the bush (Burnet, 1935).

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In Asia, as far as is known, except for Japan (and now, Malaysia), the distribution of ornithosis has not been studied, and even in Japan the incidence was practically nil, only one case having been reported between 1876 to 1950 (Meyer, 1953).

In extensive epidemiological studies, ornithosis was found in 133 species of birds including psittacine birds, canaries, finches, linnets, fulmars, seagulls, pigeons, doves, pheasants, chickens, ducks, egrets and turkeys (Meyer and Eddie, 1964). In infection of birds other than psittacines, the turkey is most important and many cases of ornithosis have occurred in people handling them. Pigeons, wild and domestic, are potential sources of ornithosis and have been reported by almost every country, where studies have been made, to be widely infected (Meyer, 1959). Fortunately, they are usually infected with less virulent strains which are less likely to infect man (Andrewes, 1967).

Ornithosis is normally latent in birds but may be activated under conditions of stress. Most important among these are over-crowding during shipment abroad, rearing under unhygienic conditions and nesting, during which the host-parasite balance is upset. Under normal circumstances, birds harbouring the agent can be apparently healthy and therefore act as carriers.

## ORNITHOSIS IN P. MALAYSIA

### Background

In Malaysia, ornithosis is not regarded as a common cause of pyrexia of unknown origin (PUO) or respiratory infection as it is in western countries, and is therefore not routinely included as one of the infections usually investigated in PUO. Unlike countries in the west where bird rearing, mainly that of the parakeet family, is common especially among elderly women, Malaysians do not commonly make pets of birds. Even if they do, they seldom keep them constantly in close proximity with themselves and usually enclose them in cages placed outside the house or in the garden.

However, this does not preclude the existence of the infection in this country. The first recorded incidence of ornithosis in Malaysia was made by the Institute for Medical Research (IMR) in 1959. A German missionary lady-doctor, in May of that year, reported cases of fever, headache and cough in a Chinese family of seven in Grik, North Perak. She suspected that the illness might have been connected with that of several pigeons which the family was rearing, and ornithosis was considered a possibility. Blood specimens from the patients were collected for serological studies and three of

the semi-domestic pigeons were brought back to the laboratory for bleeding and attempted isolation of the ornithosis agent from their faecal droppings.

Although all the patients were found negative, all the pigeons were positive for completion fixation antibodies at titres of 1:20. However, no viruses were isolated from the faecal samples of the pigeons either by mouse (intraperitoneal) or egg embryo (yolk sac) inoculation. A follow-up of the disease in Grik indicated that it had not spread beyond the pigeon population, so no action was taken except to advise the owners of the infected pigeons to eliminate the birds as early and completely as possible.

### Present Study

Interest in ornithosis was revived in 1970 when the authors of this paper agreed on a collaborative study of the disease in PUO cases in Peninsular Malaysia, B.B. doing the complement fixation tests (since the reagents were not readily available in bulk to the IMR) and DSKT collecting random paired acute and convalescent phase sera from Malaysian PUO patients for the tests.

During the process of this examination, a lady doctor (S.P.) who was acting as a volunteer medical officer for the Pure Life Orphanage-cum-School in Puchong (about 10 miles from Kuala Lumpur) was found positive. As the orphanage she frequently visited had many stray pigeons which sometimes were seen to fall ill; the pigeons, volunteer teachers, supervisors and orphans of the Orphanage were also examined.

Another study was carried out in 1972 at the Batu Caves Hindu Temple, about 7 miles from Kuala Lumpur, where a Tamil school sponsored by the Temple was situated. Here, also, were many stray pigeons attracted by the food left over by the temple devotees. In both the Pure Life Orphanage and the Batu Caves Temple, the pigeon population has been steadily increasing. However, no report of illness, respiratory or otherwise, had been received from any of the contacts.

## MATERIALS AND METHODS

### Sera (a) Human

- (i) A total of 119 paired sera was collected from PUO patients throughout P. Malaysia during the acute and convalescent phases of the febrile disease.
- (ii) Thirteen single serum specimens from normal human contacts of pigeons in the Pure Life Orphanage in Puchong were collected.

(b) *Pigeon*

(i) Sera were collected from 5 apparently healthy pigeons captured from the Pure Life Orphanage.

(ii) Sera from 12 healthy pigeons captured from the Batu Caves Hindu Temple were also collected.

All the sera were tested by the complement fixation (CF) test.

**Faecal Samples**

For virus isolation the faecal droppings from each pigeon were suspended in 10 ml. buffered saline in proportions of approximately 1:3 by volume. The suspension was shaken thoroughly using glass beads to disperse the solids, and centrifuged at 300 g for 10 minutes. The supernate was then passed through a Millipore filter (pore size: 0.42). No antibiotics were added.

About 0.05 ml. of the filtrate was instilled intranasally into groups of 6 lightly anesthetized mice, which were then observed for about 10 days. On the 10th day, the mice, healthy or otherwise were killed and their lungs examined for pneumonic foci. One blind passage was performed. Smears made from lung segments were stained with Macchiavello's stain. Demonstration of elementary bodies in the smears was the criterion of virus isolation.

**RESULTS**

Of 119 PUO patients investigated, only 2 (1.7%) showed significant rises in antibody titres in their paired sera. The following describes the details of the two patients:

1. In May, 1970, G.R., an Indian man of 69 years residing in Seremban (40 miles from Kuala Lumpur) complained of severe vomiting and pain in the right hypochondrium. He had a fever, jaundice and a palpable liver. No history of contact with birds was available.

The CF titres of his paired sera obtained on the 9th and 15th days of illness were 1:8 and 1:64, respectively.

2. Also in May, 1970, S.P., an Indian lady doctor, aged 40 years and residing in Kuala Lumpur, had a fever and chills, severe headache, malaise, generalised body aches and conjunctivitis. She had no respiratory or abdominal signs or symptoms.

She gave a history of indirect contact with pigeons at the Pure Life Orphanage in Puchong where she worked as a volunteer medical officer for several years.

The CF titres of her sera collected on the 1st and 14th day of illness were 1:4 and 1:64, respectively.

Of 17 pigeons captured from both the Pure Life Orphanage and the Batu Caves Temple, 10 (59.8%) were positive serologically (Table) although no viruses were isolated from their faecal samples. 40% (2/5) pigeons from the Pure Life Orphanage and 66.6% (8/12) pigeons from the Batu Caves Temple were positive. Their CF titres were 1:4 (2), 1:32 (4), 1:64 (3) and  $\geq$  1:256 (1). All the human contacts from the Pure Life Orphanage were negative for antibodies.

**Table**  
**Ornithosis CF Antibodies of Pigeons and Normal People**

| Species | Locality            | No. Examined | No. Positive | % Positive |
|---------|---------------------|--------------|--------------|------------|
| Pigeons | Pure Life Orphanage | 5            | 2            | 40.0       |
|         | Batu Caves          | 12           | 8            | 66.6       |
| Total   | -                   | 17           | 10           | 59.8       |
| Human   | Pure Life Orphanage | 13           | 0            | 0          |

**DISCUSSION**

Ornithosis would probably not have been brought to the attention of the IMR had the doctor who treated the pigeon owners in Grik in 1959 been a locally trained medical officer. The fact that she was German and was trained to recognize ornithosis as a possible cause of PUO was instrumental in her notifying the IMR, thus initiating studies on this disease in Malaysia.

The consistent finding of ornithosis CF antibodies in pigeons and not in any of their normal human contacts seems to indicate a low index of transmission of the infection from pigeon to man. This could be attributed to a less virulent strain excreted by pigeons and to the relative inattention Malaysians pay to pigeons even though they may occasionally feed them with left-over food.

It is noteworthy that none of the pigeons' faecal samples yielded any isolates although both egg embryos and mice were used as hosts in initial isolation attempts. Perhaps, if more than one blind passage had been carried out some isolates might have been obtained. On the other hand, excretion of the agent might have been intermittent and the isolation attempts might have been made during

the non-excreting intervals. Furthermore, the virulence of the agent might have been too low to infect the laboratory hosts effectively.

Whatever the reasons, it would seem that ornithosis in these free-flying pigeons is in latent form and will remain so provided they are not submitted to overcrowding, unhygienic conditions or other forms of stress. However, their numbers should not be allowed to increase beyond control and any ill pigeon should be treated immediately. As it is customary for Buddhist temples in Malaysia to collect hundreds of pigeons together to be released on Wesak Day annually, ornithosis could be reactivated during the period of captivity when overcrowding cannot be avoided. If this period has to be necessarily long, it would be advisable for antibiotics to be added to the feed of these pigeons during captivity.

Birds imported into Malaysia include mainly poultry (at the stage of one-day-old chicks) usually from Thailand and Singapore and occasionally from Holland and the United States. Exotic birds like the budgerigars, parrots, canaries etc. are also imported but more by the Games Department and private dealers.

A certificate of health is required from exporters of all birds into Malaysia. When they arrive at the various ports, they are inspected by a government veterinarian who has been notified by the customs officials and allowed into the country only after they have been certified healthy. Birds which fall ill while being held by bird dealers are usually treated, sometimes with antibiotics mixed with their feed.

Although under normal circumstances pigeons and exotic birds in Malaysia do not seem to pose a significant public health problem to human contacts, the fact that ornithosis do exist in Malaysia and 2 human cases have been detected warrants further studies of this infection in other species of birds especially fowls which man has much more affinity with in his daily run of life. It is hoped that with the aid of the Veterinary Department such studies can be carried out in the near future.

## SUMMARY

Ornithosis in Malaysia was first discovered by the IMR in 1959 through a German missionary lady doctor in Grik, N. Perak, who notified the Institute regarding the possibility of the infection having been transmitted from several pigeons to a Chinese family, the owners of the pigeons. Labora-

tory investigations showed that none of the patients were positive for CF antibodies but all the 3 pigeons captured from Grik were, although their faecal samples did not yield any isolates.

In 1970, the authors agreed on a collaborative study of ornithosis in PUO patients in Malaysia. Of 199 studied, only 2 (1.7%) showed significant rises in CF antibody titre in their paired sera. One of them had indirect contact with pigeons at the Pure Life Orphanage-cum-school in Puchong where she worked as volunteer medical officer for several years. Blood specimens of 5 pigeons and 13 human contacts from the Orphanage were examined. Once again, only the pigeons were positive (2/5 or 40%).

Another survey was done in 1972 on pigeons alone at the Batu Caves Temple where a Tamil school was situated. 8/12 or 66.6% of the pigeons were positive.

Ornithosis, therefore, appears to be widespread in pigeons in P. Malaysia although its transmission to human contacts seems uncommon. An account of the disease is given and the implications of its presence in Malaysia, discussed. It is hoped that further epidemiology studies on other species of birds, especially fowls, can be carried out in the near future, preferably with the assistance of the Veterinary Department.

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