

Toxoplasmosis : human toxoplasma infection : the life cycle of toxoplasma : how humans acquire toxoplasma : prevention of toxoplasmosis / Susan M. Hall.

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The second important source is meat; the organism could be acquired from tissue cysts either by eating or by handling raw or partially cooked meat. One outbreak of the infection in the USA was due to eating poorly cooked hamburgers and the very high prevalence of the disease in France is thought to be due to the French fondness for underdone meat.

Veterinary surgeons and farmers may acquire toxoplasmosis by direct contact with aborted tissue from infected animals.

PREVENTION OF TOXOPLASMOSIS

Schemes for prevention of toxoplasmosis are aimed principally at women of childbearing age because of the seriousness of congenital disease. In Britain they consist of health education stressing the following points: use of gloves when gardening and washing the hands afterwards; washing salad vegetables thoroughly; using gloves when cleaning the cat's litter box which should be sterilised with nearly boiling water and emptied daily so that if cysts are being shed they are disposed of before becoming infectious; not feeding the cat raw meat; thoroughly cooking meat (till brown) before eating; washing hands after handling raw meat.

The recent notoriety achieved by toxoplasmosis should not be allowed to tarnish the good name of the cat. The cat owner who acquires toxoplasmosis should remember that he or she is as likely to have contracted the infection from meat or from soil contaminated by someone else's cat as from his or her own animal, especially if the latter is a healthy adult. By the time the human infection is diagnosed, even if the family pet is the source, it will now be non-infectious and there could be no possible justification for euthanasia unless it is ill. Blood tests can be done but they may not be helpful in demonstrating recent infection. If positive, they indicate that the cat is now 'safe'.

S.M. Hall MSc. MFCM

THE CATS PROTECTION LEAGUE

(Registered National Charity No. 203644)



Published for distribution to cat owners

TOXOPLASMOSIS

HUMAN TOXOPLASMA INFECTION
THE LIFE CYCLE OF TOXOPLASMA
HOW HUMANS ACQUIRE TOXOPLASMA
PREVENTION OF TOXOPLASMOSIS



THE CATS PROTECTION LEAGUE

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The Cats Protection League was founded in 1927 and is the oldest Charity devoted solely to the welfare of cats.

OBJECTS

1. To rescue stray and unwanted cats and kittens, rehabilitate and rehome them where possible.
2. To inform the public on the care of cats and kittens.
3. To encourage the neutering of all cats not required for breeding.

When toxoplasmosis and cats became the subject of much uninformed comment in the media, we approached Dr Susan Hall MSc MFCM of the Public Health Laboratory Communicable Disease Surveillance Centre with a request that she provide us with a short article on the subject.

This is her article and we are most grateful to Dr Hall for restoring the balance and putting toxoplasmosis back into perspective.

INTRODUCTION

Toxoplasmosis is an infection caused by a microscopic, single-celled parasite called *Toxoplasma gondii*. This organism is larger than the bacteria and viruses which are the usual and familiar causes of many human infections. Other protozoa (single-celled animals) which infect man include the malarial parasite and a type of amoeba which causes dysentery. Unlike malaria and amoebic dysentery, however, toxoplasmosis has received little public attention until recently, when a well known athlete contracted the infection and it became headline news. The role of cats in the transmission of toxoplasmosis was given considerable publicity. In order to allay anxiety about the possibility of these household pets posing a serious threat to human health, this article aims to summarise what is known about toxoplasmosis: signs and symptoms in man; the life cycle of the organism; how humans may acquire the disease; what can be done about prevention.

HUMAN TOXOPLASMA INFECTION

(i) Mild Disease

Toxoplasmosis is very common. Blood tests have shown that approximately half of the population of this country have acquired the infection by the time they are middle aged. In the majority of cases the infected person will have experienced no symptoms at all or may have had a mild 'flu-like illness for which he or she probably would not have consulted a doctor.

A few people, for reasons which are poorly understood, develop an illness very much like glandular fever when they acquire toxoplasmosis; they have a fever, feel generally unwell and achy, and their lymph glands, liver and spleen become enlarged. About 200 such cases are reported each year in England and Wales. Such people are likely to seek medical help and the diagnosis is usually made by performing special antibody tests (one is called the 'dye' test) on the blood. Sometimes two blood samples are required because in an acute infection it is possible to demonstrate the antibody levels rising over a period of two to three weeks. Although the person may feel unwell for a few weeks, recovery is the rule and, in the majority of people, toxoplasmosis will not recur or become chronic, although the parasite will remain in the person's body for the rest of their life.

(ii) Serious Disease

There are two uncommon circumstances when toxoplasmosis can be very serious indeed. The first occurs in people whose immune systems become compromised for various reasons, for example by drug treatment given to overcome the rejection of transplanted organs or to treat some forms of cancer. Some of the patients with the newly recognised disease Acquired Immune Deficiency Syndrome (AIDS) have died from toxoplasmosis. In these immune-compromised people the parasite runs riot in the body, its serious effects resulting from invasion of the brain and the heart. In most cases it is not known if the infection is due to recent acquisition of the organism or to reactivation of an infection acquired long ago.

The second occasion when toxoplasmosis has serious effects, occurs when a pregnant woman acquires the infection for the first time (there is no danger if infection occurred before pregnancy). In approximately half of pregnant women who acquire the infection, the organism is transmitted to the baby in the womb. The baby will then be born with congenital toxoplasmosis (CT) which can have a wide range of effects: in approximately one tenth of cases there will be serious abnormalities or illness obvious at birth, including hydrocephalus (an abnormally large head and water on the brain), jaundice with a rash and an enlarged liver, and sometimes a serious inflammation of the back of the eye called choroido-retinitis. These severe cases are rare, about four or five are recognised annually in England and Wales. In most cases of CT, there are no obvious signs at birth and if (as is usual) the mother

has had no symptoms during pregnancy, the infection usually remains undiagnosed. A proportion of these undiagnosed patients will, however develop choroido-retinitis in later life which may cause episodes of deterioration in vision.

Treatment

Toxoplasmosis can be treated by drugs. These are usually used for episodes of choroido-retinitis, for newborn babies in whom CT is diagnosed and for immunocompromised people. They are sometimes given to women in whom acute toxoplasmosis is diagnosed in pregnancy although therapeutic abortion may also be offered, depending on the stage of pregnancy when infection occurs.

THE LIFE CYCLE OF TOXOPLASMA

In addition to man, toxoplasma parasitizes a wide range of other animal hosts, principally mammals, birds and reptiles. It is an important cause of abortion in sheep and also infects other meat animals. In order to understand how the disease is acquired both by Man and by other species, a brief description of the life cycle of the parasite is necessary. It exists in three forms: (1) the adult protozoan, found in the blood stream and cells of the host in the early stages of infection; (2) the oocyst (egg cyst) found only in the faeces of members of the cat family; (3) the tissue cyst found in the tissues (principally muscles and the nervous system) of infected hosts.

The domestic cat acquires toxoplasmosis (usually when still a kitten) by eating infected wild birds or small rodents in which the tissue cyst is present; if its owner feeds it raw meat this can be another source of the toxoplasma tissue cyst. Alternatively it may acquire the oocyst from the environment if there is contamination by the faeces of other cats. The oocyst can survive for more than a year in soil, provided that the right warm, moist and shady conditions prevail. Healthy cats rarely show any symptoms of toxoplasmosis although it may cause inflammation of the liver, lungs or brain or may be associated with diarrhoea. Symptoms are more likely in animals debilitated by disease or starvation.

Two weeks after the cat first acquires the parasite, the organism has been through its reproductive phase in the intestine of the cat and the egg cysts are shed in millions in the faeces. They become infectious after 3 to 5 days. Shedding goes on for two weeks then stops and is unlikely to recur unless the cat becomes debilitated.

It is thought that herbivorous animals such as sheep and cattle acquire toxoplasmosis from grass and soil contaminated with the egg cysts; alternatively, if an animal aborts due to toxoplasmosis, heavy contamination of the pasture by the aborted material and transmission to other animals by tissue cysts may occur. Carnivorous animals probably acquire toxoplasmosis by eating the tissue cysts in the flesh of their victims as well as from environmental oocysts.

HOW HUMANS ACQUIRE TOXOPLASMA

From the above, it can be seen that there are two principle sources of toxoplasma for humans: Firstly, soil or litter contaminated by cat faeces. Contact with the infected material may occur during gardening, emptying litter trays or by eating or handling uncooked vegetables contaminated with garden soil. Two human outbreaks of the disease have been linked with cats: in one, children were eating contaminated soil while in the other, infected cats and kittens were defaecating in the sawdust of an indoor riding school resulting in infection among the patrons. Apart from these two instances, there is little published evidence linking human disease directly to a cat source. Some studies have shown a relationship between cat ownership or cat density and the likelihood of having a positive toxoplasma blood test, while others have shown the reverse.