

Toxoplasmosis:

It's not just a game of cat and mouse!

In spite of popular belief that contact with cats can be a major route for toxoplasmosis infection, a major study published in the *British Medical Journal* (BMJ) concluded that “contact with cats was not a risk factor” in their study of sources of toxoplasma infection in pregnancy.

The study also concluded that “health messages to women are unclear” about the sources of toxoplasma infection and called for better information to be made available. This need extends beyond that for women who are pregnant, or planning to become pregnant, to people who have reduced immune functioning.

Beliefs about the risk of cats to these sections of the population may detract from identification of more serious risks. This review is designed to help health professionals inform their clients who are pregnant, planning to become pregnant, or who have reduced immune functioning about caring for their own health whilst caring for their cat.

Some main points that patients are anxious to know:

■ **The family cat is unlikely to be a risk.**

Although cats are a vital link in the transmission of toxoplasmosis, the primary risk is from young cats or kittens after their first hunting venture when they catch and eat an infected bird or rodent. Even then, toxoplasma cysts are shed in the cat's faeces for only a couple of weeks. Thereafter, it is very unlikely to pose a threat.

■ **The main source of toxoplasma infection is through raw and undercooked meat.**

This can be easily avoided through hygiene and cooking practices.

■ **Other major sources of toxoplasmosis are through soil.**

Eg when gardening, or through inadequately washed vegetables and salads.

■ **Some people are already immune to toxoplasmosis prior to becoming pregnant.**

Around 30% of 30-year-olds will have already been infected earlier in their lives, usually through one of the above routes. Once a woman has had the disease she will be protected throughout subsequent pregnancies.

■ **Pet ownership itself is associated with many health benefits.**

There are very few instances where a pet should be rehomed to safeguard its owner's health. Indeed, in many cases there are strong arguments why a pet should remain.

Cats are the most popular pet in the UK and bring companionship and pleasure to many families and single people. However, there can be times in cat owners' lives when they need reassurance and advice about whether their cat could pose a risk to their health.

Cats Protection is frequently approached to advise on the health risks of cat ownership to people fearful of toxoplasmosis in pregnancy or if they have reduced immune functioning such as in HIV positive owners. Sadly, the fear is such that some owners feel they have to give up their cats – usually completely unnecessarily, causing distress to both owner and pet.

Recent research published in the *BMJ* rightly states that “health messages to women have been unclear because of the uncertainty about the principal sources of infection”. This uncertainty can also be extended to sources of risk for people with compromised immune functioning.

Whilst Cats Protection recognises the serious health risks that can be posed by toxoplasmosis to vulnerable sections of the community, it is also increasingly clear that living with a cat need not be a risk factor. We hope that this summary helps inform and reassure those cat owners who may be worried about toxoplasmosis.



Prevalence of toxoplasmosis

It is estimated that between a quarter and a half of the world's population is infected. Infection is most common where the climate is warm and moist, enabling infectious oocysts shed in cats faeces to survive in soil for up to 18 months. Since these may be passed on to other animals and can form viable tissue cysts in farm animals raised for meat and dairy produce, there is a higher risk for toxoplasmosis in cultures where the diet frequently includes undercooked or raw meat, or unpasteurised dairy products, especially goat's milk products. Diets high in raw fruit and vegetables which may be inadequately washed are also high risk for toxoplasmosis infection.

In the UK it is estimated that between one half and one per cent of the population acquire the infection each year and that over 40% of the population have been infected by the age of 50 years. Few cases produce more than mild 'flu-like symptoms and sufferers may be unaware of the nature of the infection. Infection usually results in future immunity and protection of a developing foetus. However, in people with reduced immunity, such as AIDS patients, those receiving some cancer treatments, and transplant patients may be susceptible to fresh infection.

Principal groups at risk are women who have not been exposed to the toxoplasma parasite previously but become infected in the months immediately preceding conception or during the first three months of pregnancy, and people with reduced immunity.

Risks in pregnancy

If a woman is infected with toxoplasmosis for the first time just before pregnancy or during early pregnancy, there is up to a 40% risk that the foetus will be infected. This risk varies according to when the mother acquired the infection.

- If acquired two to three months prior to conception, risk of transmission to the foetus is low but, if it is infected, risks for miscarriage are high.
- First trimester – the risk of transmission rises to about 15%. A foetus infected at this stage has high risk of miscarriage or being born with hydrocephalus, calcifications of the brain or retinoblastoma.
- Second trimester – the risk of foetal infection is about 25%.
- Third trimester – risk of foetal infection may be as high as 65% and, although babies may appear normal at birth, the majority will develop symptoms, such as retinoblastoma, later in life.

Risks for people with reduced immunity

In patients with poor immunity, including those being treated for AIDS, Hodgkin's disease, leukaemia or transplant recipients, the consequence of infection is often a triggering of an old infection, although it can be newly acquired. Risk of toxoplasmosis is high when T-cell (CD4+) counts are below 100. Infection is likely to be serious, even fatal.

But are cats the problem?

The study published in *BMJ* concluded, "Contact with cats was not a risk factor."

Although cats are indeed a vital link in the transmission of toxoplasmosis, the family cat is very little risk to its owner or their family. This is because cats are usually only a source of potential infection when they are kittens or very young adults and have been out on their first hunting expedition where they have caught and ingested the parasite from an infected bird or rodent. The cat will then shed infectious oocysts in its faeces for a very short period only, usually about 14 days. Thereafter the cat is extremely unlikely to pose a risk unless it becomes ill with a serious illness such as feline leukaemia or feline immunodeficiency virus. Even then the risks are small but it is worth patients who are worried about risks to their own health to have a vet check that their cat is healthy.

A healthy adult cat is unlikely to present any threat of illness to its owner or an unborn child.

So what are the main sources of toxoplasma infection?

The most significant sources of toxoplasma infection are not those associated directly with the cat. Rather, they are those that have indirect association with contaminated cat faeces, such as from animal products derived from farm stock or poultry grazed on contaminated land, and fruit or vegetables grown in contaminated soil.

Undercooked / raw meat

The main source of infection is believed to be undercooked meat or meat products. Lamb, pork, beef and game are regarded as especially risky if eaten raw, or undercooked. Cured meat products can also constitute a risk for infection if made from meats inadequately cooked to kill viable tissue cysts.

The study reported in the *British Medical Journal* collected data from six major European cities. In all data collection centres, the main risk factor for toxoplasma infection was through undercooked meat. This accounted for between 30% and 63% of infections, the greatest risk being in countries with relatively high consumption levels of meats/meat products conventionally containing raw, undercooked or inadequately cured meat.

Other foods

Dairy products made from unpasteurised, untreated milk can also pose risks of toxoplasma infection. Goat's milk products are regarded as especial risks.

Inadequately washed fruit and vegetables which have been grown in soil contaminated with cat faeces can transfer the infectious oocysts. Even packaged fruit and vegetables purchased from supermarkets should be washed thoroughly.

Travelling to countries where farming practices and cooking methods carry risks for toxoplasma infection.

Many popular holiday locations have large populations of feral cats which will have important implications for potential safety of foods produced locally. In addition, many local cooking practices may involve the serving of undercooked meat or meat products.

Gardening and farming

In the European multi-centre study, between six per cent and 17% of toxoplasma infections were attributed to contact with contaminated soil. A principal risk is gardening in areas where cats have deposited faeces. Infectious oocysts are transferred from unwashed hands to the mouth.

Similar risks are incurred in manual farming practices where there is contact with potentially contaminated soil.

Farming also carries risks where sheep are reared. Sheep infected from contaminated pasture are special risks during lambing (because of contact with the placenta) and people vulnerable to risks of toxoplasmosis should avoid contact with sheep during this time. This may have particular implications for those involved in stock management or veterinary work.

However, indirect contact with these factors, such as having a partner or family member involved in such work, is not thought to pose a risk, provided correct standards of hygiene are observed.

Preventing toxoplasma infection

Avoidance of risk factors wherever possible is the only way of preventing toxoplasma infection. However, these are not difficult to manage.

For women who are pregnant, or planning to become pregnant, and for people with reduced immunity, the following advice should be adhered to:

- 1** Do not eat meat or poultry which has not been cooked thoroughly throughout. Avoid "rare" undercooked meat dishes or raw meat products. Cooking meat to an internal temperature of 70C degrees for at least 15-30 minutes will destroy tissue cysts in meat. Salting, pickling or smoking meats does not reliably kill cysts, and many cured meat products, such as Parma ham and continental style sausages, are also best avoided because they contain raw meats.
- 2** Wash hands, cooking utensils and work surfaces thoroughly after handling and preparing raw meat.
- 3** Keep raw meats separate from cooked meats.
- 4** Control flies and other insects as much as possible, as they may transfer contamination from cat faeces on to food.
- 5** Wash all fruit, vegetables and salads thoroughly before eating them. This should include even pre-packed or pre-washed fruit and vegetables purchased from supermarkets.
- 6** Clean work surfaces and utensils of soil after preparing vegetables and salads.
- 7** Always wear gloves when gardening or working with soil. Avoid hand-to-mouth contact and always wash hands thoroughly after gardening.
- 8** Cover children's sand pits to avoid cats using them as litter boxes.
- 9** Avoid unpasteurised dairy products, especially goat's milk products.
- 10** Avoid contact with sheep during lambing time. This includes visits to pet's corners, children's zoos and the like at this time.

It is important to remember to observe these points when eating out, on holiday or travelling.

Specific advice for cat owners

■ Even though your cat is only a small risk, you should, where possible, have someone else deal with the cat litter box. This should be changed at least once a day because any oocysts in faeces become infectious 24 hours after they have been excreted. Chemical disinfection is not a reliable method of destroying oocysts; it is more effective to use scalding water.

■ If you have to deal with the litter box yourself, always wear gloves and wash your hands very thoroughly afterwards.

■ Do not allow your cat to jump on work surfaces where food is prepared. You should also ban your cat from your bed, pillows and cushions because of possible contamination on the cat's paws.

■ Try to prevent your cat from catching birds and rodents or having access to unpasteurised dairy products.

■ Feed your cat canned or dry food instead of raw meat products.

■ Avoid contact with free-roaming or stray cats, young kittens or any cat which seems unwell.

Observing these precautions can mean peace of mind and the chance to enjoy your cat.

There is considerable evidence that cats can add to their owner's sense of well-being. Cat owners report fewer symptoms of daily stress than non-pet owners, and for people adjusting to major life events such as coping with serious illness, cats have been shown to give emotional support. In a study of breast cancer patients, cat-owning women reported a better sense of control over their illness and more optimism for the future.

Most cat owners are reluctant to give up their pets and the benefits they bring. With care and advice, most will not have to.

For further advice, contact Cats Protection, 08702 099 099; website: www.cats.org.uk or e-mail: cpl@cats.org.uk

About the author

June McNicholas BSc PhD is a Senior Research Fellow and Lecturer in Health Psychology at the University of Warwick. She is regarded as one of Europe's leading researchers in the field of the health benefits and risks of pet ownership.

Other useful sources

Cook, A.J.C. et al. (2000) Sources of toxoplasma infection in pregnant women: European multicentre case-control study. **British Medical Journal**: 321:142-147.

Tommy's, the baby charity. 1 Kennington Road, London SE1 7RR. Website: www.tommys.org

The Toxoplasmosis Trust. Room 26, 61-71 Collier Street, London, N19BE.

Project Inform: Information, inspiration and advocacy for people living with HIV/AIDS. Website: www.projectinform.org

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