Toxoplasmosis

New Zealand Maternal Fetal Medicine Network

This guideline was updated in July 2015 by Dr Suganthi Chandru with input from members of the New Zealand Maternal Fetal Medicine Network.

Background

Toxoplasma gondii is a protozoan parasite. Members of the cat family are the definitive host. *T gondii* exists in 3 forms:

- The oocyst: shed only in cat faeces
- The tachyzoite: rapidly dividing form in acute phase of infection
- The bradyzoite: slow growing form in tissue cysts

Sources of infection:

- ingestion of oocytes from hands or food contaminated with cat litter
- ingestion of undercooked infected meat containing Toxoplasma cysts
- organ transplantation or blood transfusion
- transplacental transmission
- accidental innoculation of tachyzoites (needlestick injury)

Clinical Manifestations:

- Once infected, the parasite lies dormant in neural and muscle tissue and is never eliminated. Immune competent humans are able to keep it dormant.
- Clinical manifestation is usually in the form of retinochoroiditis and visual impairment

Congenital infection sequelae: intracranial lesions, infection in infancy, serious neurological impairment (seizures, cerebral palsy), retinochoroiditis. Treatment of the mother may reduce the incidence of congenital infection and reduce sequelae in the infant. Prompt and accurate diagnosis is important.

Objective

To guide accurate diagnosis, investigation and management of possible maternal Toxoplasmosis infection.

Differential Diagnosis

Other viral infections: such as Epstein Barr, Cytomegalovirus, Rubella, Parvovirus mostly asymptomatic in adults -“slap cheek” fever in children.

Important History

- Incubation period is 5 to 23 days after ingesting the infective cysts
- Acute infection is usually asymptomatic
- Non-specific symptoms include: fatigue, fever, headache, myalgia, lymphadenopathy (especially cervical)

Risk of Transmission

- Immunocompetent women with prior infection do not transmit toxoplasmosis to the fetus
- Women with possible parasitaemia in pregnancy are at risk of transmitting toxoplasmosis to the fetus. This includes primary infection and immunocompromised women
- Congenital toxoplasmosis secondary to re-infection is rare

The incidence and severity of congenital toxoplasmosis varies with the trimester during which infection is acquired

Risk of transmission	Risk of fetal damage if infected
1st trimester 10%	1st trimester 90%
2nd trimester 44%	2nd trimester 20%
3rd trimester 90%	3rd trimester 10%

Retinochorioditis similar frequency in all gestations

Ultrasound

- Calcifications in fetal liver and brain
- Cerebral ventriculomegaly
- Non immune hydrops
- IF Amniotic fluid PCR negative, monthly surveillance for: late hydrocephalus/cortical necrosis/ hepatosplenomegaly

Investigation and Diagnosis

Maternal infection and serology

- Minimum 2 blood samples at least 2 weeks apart showing seroconversion
- IgM response can last 10-13 months (or even longer) and varies with individuals

Avidity indicates the strength with which antibody binds antigen

Low avidity IgG indicates acute or recent infection

High avidity IgG indicates not current / not recent infection / likely past infection

- **IgG -ve IgM -ve** : rules out primary infection

- **IgG +ve IgM -ve** : infection > 2 years ago
- **IgG** -ve **–** IgM +ve infection around 2 weeks ago
- **gG +ve IgM +ve** : Infection <6 months ago
- **IgG avidity high** – infection > 12 weeks ago
- **IgG avidity low** – infection < 12 weeks ago

Women should be referred to fetal medicine unit for further management.

Congenital infection investigation

Consider amniocentesis: PCR amniotic fluid ((sensitivity 81% to 90%, specificity 96% to 100%). Amniocentesis for the identification of *T. gondii* infection should not be offered at less than 18 weeks' gestation because of the high rate of false-negative results, and should be offered no less than 4 weeks after the time of suspected acute maternal infection.

Negative PCR may result from delayed transmission especially in early exposure.

Prognosis Fetal

- 70-90% of infants with congenital toxoplasmosis are asymptomatic at birth.
- Disease is subclinical. Classic triad: chorioretinitis, hydrocephalus, intracranial calcifications.
- Ocular Toxoplasmosis: patients are often asymptomatic until 2nd or 3rd decade of life, subsequent development of bilateral chorioretinitis

Without treatment: there is high risk of subsequent abnormality, with long term morbidity and central nervous system involvement. Most common late finding is chorioretinitis resulting in vision loss.

With treatment: Postnataly it has been found that 90% develop no new eye lesions. >72% with abnormal neurology at birth are subsequently normal.

On-going Management

Treatment in pregnancy

Recent evidence (EMSCOTT study) that prenatal treatment substantially reduces the proportion of infected fetuses that develop severe neurological sequelae. There is also a reported 50% reduction in risk of congenital transmission if treated. Prenatal treatment is offered.

The safety of Spiramycin and combination therapies for the fetus has been reviewed and considered to be safe with a favourable risk benefit profile.

Standard practice is to treat maternal infection with Spiramycin which is not toxic to the fetus. Should fetal infection be confirmed add pyrimethamine and sulfadiazine (P/S). (folinic acid is added)

If maternal seroconversion:

Spiramycin 1G TDS until delivery (hospital exceptional circumstances application to Pharmac)

If fetal infection confirmed (PCR positive), ADD:

- Pyrimethamine 25mg BD (Folic acid antagonist: can cause dose related bone marrow suppression, anemia, leukopenia, thrombocytopenia)
- Sulfadiazine 1G TDS (Folic acid antagonist: works synergistically with Pyrimethamine)
- Folinic acid 10-25mg daily (To prevent bone marrow suppression)
- Or combination Spiramycin/Cotrimoxazole from 14 weeks
- Suggest monitor full blood count weekly

Other option:

- Azithromycin 500mg daily with Pyrimethamine

Management of infant:

- Ophthalmologist/auditory/neurology review before discharge
- Radiology: Head USS/MRI
- Laboratory: Serology: IgM at birth; IgG persists >6months. PCR blood/CSF/placenta
- Paediatrician referral and ongoing review
- Treatment for one year

Prevention

- Prevention is based on avoiding sources of infection:
- Handwashing

- Gloves in the garden and gloves to clean kitty litter
- Cooking meat well: meat should be cooked to 66C or frozen for 24 hours at less than -12C
- Washing salad leaves and vegetables
- Avoid travel to less developed countries with more virulent parasite strains

References

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