Screening brief

Antenatal and neonatal screening for congenital toxoplasmosis infection

Burden of disease

- Incidence of maternal infection during pregnancy: approximately 8/1000 susceptible (antibody negative) pregnancies in France (46% of pregnancies are susceptible)[1] and below 3/1000 in Scandinavia and the UK (75-90% of pregnancies are susceptible)[2-5]
- Birth prevalence of congenital toxoplasmosis: 1 to 10 per 10 000 live births[1 2 4 6 7]
- The infection is important because of its complications, the most common are retinochoroiditis, intracranial calcification, or hydrocephalus. One or more of these occur in 20–30% of infected children[6 7] Severe neurological impairment is rare (⩽5%), but no information is available on mild/moderate impairment. Some degree of unilateral visual impairment occurs in up to 50% of children with retinochoroidal lesions[6]

Natural history

- Risk of mother to child transmission increases with gestation at maternal infection. Given transmission, the risk of complications is highest when mothers are infected in early pregnancy. Combining these effects, the risk of an infected child with complications is highest for mothers infected between 24 and 30 weeks' gestation (10%), and lowest in the first trimester (5%) and at term (6%)[6]

Antenatal screening to detect infection acquired during pregnancy

- Serological testing to identify susceptible women, and thereafter, monthly or three monthly retesting to detect seroconversion. The false positive rate for testing is 0–2%. For susceptible women who become positive one month later (one result), odds of being infected = 1 in 20 (given incidence in France and a 2% false positive rate)
- Serological markers of recent infection at the first antenatal test (for example, IgM and IgG avidity <15%, cannot distinguish between infection acquired during the pregnancy or up to 12 months before (Robert A, *et al*, unpublished data)
- Positive results should be confirmed by multiple tests

Antenatal diagnosis

- PCR detection of *T gondii* DNA in amniotic fluid; sensitivity above 90%[8]; false positive rates vary with laboratory (0–8%)[9]; mouse inoculation is 60–70% sensitive with no false positives[10]

Antenatal treatment

- The aim is to reduce the risk of mother to child transmission. Immediate treatment with spiramycin or, in late pregnancy, pyrimethamine and sulfadiazine is given, but there is no evidence that this reduces the probability of infection of the fetus[11 12]
- To reduce the risk of complications in the fetus/child: pyrimethamine and sulfadiazine. Effect is controversial.[13] Evidence of an effect is based on studies subject to referral bias[11]
- Therapeutic termination for women infected in early pregnancy, in whom fetal infection and intracranial lesions are proved

Neonatal screening

- Screening test: Detection of toxoplasma-specific IgM on the neonatal Guthrie card blood spot[4 7]
- Performance: Detects up to 85% of infected children and is highly specific.[4 7] Detection rate is lower if the mother is treated antenatally[14]

Neonatal diagnosis

- Confirmation of toxoplasma-specific IgG and IgM in peripheral blood and recent infection in the mother

Neonatal treatment

- Pyrimethamine and sulfadiazine or sulfadoxine alternating with spiramycin for 6 to 12 months.[4 6] Second line treatment: azithromycin or atovoquone. Effectiveness of such treatment is unknown

Known adverse effects of anti-toxoplasma treatment and antenatal investigations

- Reduction or cessation of treatment owing to bone marrow depression is common in the mother and infant (with pyrimethamine and sulfadiazine or sulfadoxine); spiramycin may be associated with arrhythmias in neonates.[15] For women identified by markers of recent infection at 12 weeks' gestation approximately one unaffected fetus is lost owing to amniocentesis for each infected fetus identified with lesions (5% × 25% compared with 0.9% fetal loss rate)

Overall assessment

- No evidence that antenatal screening reduces transmission, or antenatal or neonatal screening reduces the complications
- Antenatal screening appears to do more harm than good. The effect of antenatal treatment on impairment in the long term is unknown. Infection during pregnancy should be avoided by not eating undercooked or cured meat

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