

Abstract

Approximately one-third of the world's population is infected with the parasitic protozoan *Toxoplasma gondii* (*T. gondii*). Besides the classical sources of infection, sexual transmission of the parasite has recently been discussed and confirmed in many animal species. However, only indirect evidence supports this mode of transmission in humans.

Our study found that *Toxoplasma*-seropositivity of sexual partner was a risk factor for *T. gondii* infection in women. These results supported the hypothesis of unidirectional male-to-female sexual transmission. We further proposed the hypothesis of *T. gondii* transmission during oral sex when an uninfected individual ingests the ejaculate of an infected man. If the ejaculate contained tissue cysts of the parasite, a mode of infection similar to ingesting the parasite in raw meat would be expected. To determine whether *T. gondii* is indeed present in the semen of men, we subsequently conducted a study in which we were the first to demonstrate the presence of tissue cysts of the parasite in the semen of men with latent toxoplasmosis.

The impact of toxoplasmosis was also investigated in relation to reproductive functions. A higher prevalence of toxoplasmosis was found in infertile men compared to controls. In our study, we found that latent toxoplasmosis negatively affected sperm count and motility. Moreover, the negative effect of latent toxoplasmosis on semen parameters was stronger in smokers. It is also known that depression and anxiety are associated with infertility but the results of studies on the effect of *T. gondii* on depression are inconsistent. In our study on couples from the center for assisted reproduction, we showed that toxoplasmosis affected depression in men and women in opposite directions; it decreased in men and increased in women. *Toxoplasma*-positive men with a pathological spermiogram had the lowest depression scores.

Changes in behaviour, personality, and human fertility parameters caused by *T. gondii* could be either side effects of pathological processes in the body of the infected host or the product of the manipulative activity of the parasite aimed at increasing the probability of transmission to the definitive host. However, it is also possible that individuals may differ in their susceptibility to *T. gondii* infection or exhibit different levels of risk behaviours that lead to a greater likelihood of acquiring infection. However, the results of studies in experimentally infected animals support the hypothesis of infection-induced changes.

Keywords:

Toxoplasmosis, sexual transmission, oral sex, reproduction, sperm, depression