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Editorial

Toxoplasmosis and Women's Reproductive Health

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Toxoplasma gondii is a globally prevalent Apicomplexan parasite, estimated to infect 2 billion people worldwide (1). Studies indicate a higher prevalence in warm, humid climates with greater cat ownership, and significant seroprevalence has been observed in Iran (2-4) and other Middle Eastern countries (5).

Toxoplasmosis poses a serious threat to human health, particularly for pregnant women (6), impacting reproductive health aspects such as infertility and pregnancy outcomes (7). Successful pregnancies rely on intricate biological processes, including endometrial-fetal interactions (8-10). Toxoplasmosis, particularly through its impact on the immunological profile (such as pro-inflammatory cytokines) and hormonal changes, may represent a significantly overlooked contributor to endometritis, ovarian dysfunction, impaired folliculogenesis, ovarian and uterine atrophy, decreased reproductive organ weight, and reduced reproductive performance in women (11). *T. gondii*'s most significant reproductive health impact is its association with spontaneous abortion (12). Primary infection during pregnancy can result in vertical transmission to the fetus, leading to fetal death and abortion. While the risk of fetal infection is highest during the third trimester, earlier infections tend to cause more severe disease (13). The mechanisms causing *T. gondii*-related abortions are complex and multifactorial. Direct parasite invasion of the placenta and fetal tissues triggers inflammation, tissue damage, and placental dysfunction. The parasite can cross the placenta, invading vital fetal organs and causing developmental abnormalities, neurological damage, and ultimately, fetal death (14).

Prevention and management strategies, including education, food safety, hygiene, cat litter management, improved prenatal screening (amniocentesis after 18 weeks, fetal ultrasound, and fetal blood sampling), diagnostic accuracy (15), and novel therapeutic strategies, are critical for combating the global burden of *T. gondii*, reducing congenital toxoplasmosis incidence, and preventing abortion in infected pregnancies.

Author's Biosketch

Dr. Ramesh Baradaran Bagheri is a board-certified obstetrician and gynecologist with a fellowship in infertility treatment. She has approximately 19 years of clinical experience, including six years dedicated to teaching and research within Iranian academic institutions. Currently, she serves as a full-time assistant professor and Deputy for Research at the Department of Obstetrics and Gynecology at Alborz University of Medical Sciences in Iran, where she also supervises the Infertility Treatment Center.

The current gold standard treatment for *T. gondii* infection is pyrimethamine and sulfadiazine (16). However, increasing drug resistance in *T. gondii* is a concerning trend that may worsen disease severity and lead to treatment failure (17). Future research should prioritize identifying high-risk populations, optimizing screening strategies, and developing safer, more effective treatments for both maternal and congenital toxoplasmosis (18). Global efforts to develop a *T. gondii* vaccine have been ongoing for decades, with various vaccination strategies (nucleic acids, protein subunits, attenuated vaccines, and nanoparticles) showing promising results in rodents. Translating these *in vivo* findings into clinical studies remains a significant challenge (19-23).

Competing Interests

None.

Ethical Approval

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