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Some Aspects in Seroprevalence, Diagnosis, and Influence of Sex Hormones on Immunity during Human Toxoplasmosis

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in

Medical Microbiology

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Summary

Toxoplasma gondii has a worldwide distribution and is one of the most prevalent infectious agents in humans. Therefore, the present study was conducted to estimate the seroprevalence of toxoplasmosis in healthy individuals and their incidence in aborted women.

The exact mechanisms of abortion induced by *T. gondii* infection are largely still obscure. Evidence from murine and human pregnancy studies point to a strong association between maternal Th2 type immunity and successful pregnancy, whereas Th1 type immune reactivity is associated with pregnancy loss. Data indicated that a shift of Th1 to Th2 cytokines activity might be under the control of the anti-inflammatory steroid hormones (progesterone and estradiol). The delicate balance between Th1/Th2 cytokines may be disrupted by *T. gondii* infection, which is associated with hyperproduction of Th1 proinflammatory cytokines. Aberrant production of proinflammatory cytokines, TNF- α and IL-6 have been suggested to be related to the frequency of abortion caused by *T. gondii* infection. Therefore, in the present study the possible effect of TNF- α and IL-6 on steroid hormones (progesterone and estradiol) and their possible role in abortion was investigated.

The seroprevalence of anti -*Toxoplasma* Abs was estimated in 800 apparently healthy persons of both sexes by LAT (Latex Agglutination Test). The serodiagnosis of *T. gondii* infection is widely used for screening pregnant and aborted women in order to prevent congenital infection. The direct detection of the causative microorganisms in infectious disease would offer the most reliable and rapid possibility for a specific etiological diagnosis. In this study, the incidence of toxoplasmosis was detected in 135

spontaneously aborted and 13 induced abortions by two serological methods (ELISA & ELFA). The Ags of the causative agent was detected in placentae of those women by immunohistochemical (IHC) method, then compare with (ELISA & ELFA).

TNF- α and IL-6 produced by trophoblasts was investigated in paraffin embedded placental tissues by IHC test. The intensity of infection and TNF- α & IL-6 production was scored by the same IHC scoring system. Pregnancy associated hormones (progesterone & estradiol) were measured in 83 maternal serum [70 spontaneously aborted (34 infected + 36 uninfected with toxoplasmosis) + 13 induced abortion] and in 24 non-pregnant women.

The employment of LAT indicated that altogether 27.1% (217/800) apparently healthy persons were seropositive for anti-*Toxoplasma* Abs. No difference in the prevalence of infection in males (28.35; 68/240) and females (26.65 149/560) was found, with an increase in infection with the increase in age.

High incidence of acute toxoplasmosis (as indicated by the presence of anti- *Toxoplasma* IgM Abs) was reflected in this study. Toxoplasmosis was detected in 21.5 % (29/135) and in 23.7 % (31/135) spontaneously aborted women as investigated by ELISA and ELFA tests respectively. *T. gondii* Ags were confirmed in the placentae of 25.2% (34/135) spontaneously aborted women when IHC technique was used.

The three methods were all specific, but IHC was the more sensitive technique in detection of toxoplasmosis. According to IHC technique, aborted women in this study were divided into three groups, (group A) 34 aborted women infected with *T. gondii*, (group B) 36 aborted women uninfected with *T. gondii* (randomly chosen from the remainder of 135 spontaneously abortion) and the (group C) 13 induced aborted women. Group (C) was considered as control group or the normal pregnant group (they had complications other than pregnancy-associated complications).