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Do Pregnancy, Postpartum Period and Lactation Predispose to Recurrent Toxoplasmic Retinochoroiditis?

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Data Collection B
Statistical Analysis C
Data Interpretation D
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- Background:** The aim of the study was a statistical analysis of the possible effects of pregnancy, postpartum period, and lactation on increased risk for reactivation of toxoplasmic retinochoroiditis.
- Material/Methods:** A retrospective study was undertaken of the clinical records of 661 patients referred with the diagnosis of acute toxoplasmic retinochoroiditis to the Department of Zoonoses and Tropical Diseases, Medical University of Warsaw and to the Department of Ophthalmology, Medical University of Warsaw in the years 1994–2014. This group of inpatients consisted of 213 women of child-bearing age (18 to 40 years). Reactivation of toxoplasmic retinochoroiditis was observed in 24 women aged 15 to 39 years who were pregnant, in the postpartum period, or lactating. To compare the rate of the relapses in pregnant/lactating patients vs. non-pregnant/non-lactating patients, the Fisher exact test was used. Calculations were performed with WinPepi software (Abramson JH (2004) WINPEPI (PEPI-for-Windows) for epidemiologists. Epidemiologic Perspectives & Innovations, 2005, 1: 6).
- Results:** A total of 28 reactivations of toxoplasmic retinochoroiditis were observed (16 episodes in pregnancy, 4 in the postpartum period, and 8 during lactation) in 24 women aged 15 to 39 years. In 3 women, multiple episodes were reported (in early pregnancy and the postpartum period in 2 women, and during 2 pregnancies and lactation in 1 woman). Statistical analysis showed that the risk of an episode of toxoplasmic retinochoroiditis is 7.4-fold higher in pregnancy compared to the non-pregnant/non-lactating women ($p < 0.0001$).
- Conclusions:** Women of childbearing age with toxoplasma ocular lesions should be informed by their doctors about possible active recurrences during pregnancy and should be followed carefully by an ophthalmologist when pregnant.
- MeSH Keywords:** **Chorioretinitis • Data Interpretation, Statistical • Pregnancy • Recurrence • Toxoplasmosis**
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Background

Toxoplasmosis is the most common cause of retinochoroiditis resulting from the impaired immunity of the host and not the increased activity of *Toxoplasma gondii* [1,2]. Ocular toxoplasmosis runs a characteristic course of recurrences and remissions and occurs predominantly in younger patients [1]. Mc Hugh et al. and Dubey et al. showed that the rates of retinochoroiditis are higher in immunocompromised subjects [2,3]. During pregnancy and labor, the immune responses are impaired to prevent the rejection of the fetus, which theoretically may result in higher rates of reactivation in the course of quiescent infectious diseases [4].

The aim of our study was to determine whether the risk for reactivation of toxoplasmic retinochoroiditis increases during pregnancy, postpartum period, or lactation.

Material and Methods

A retrospective study was undertaken of the clinical records of 661 patients referred with the diagnosis of acute toxoplasmic retinochoroiditis at the Department of Zoonoses and Tropical Diseases, Medical University of Warsaw and at the Department of Ophthalmology, Medical University of Warsaw in the years 1994–2014.

This group of inpatients included 213 women of child-bearing age (18 to 40 years). Reactivation of toxoplasmic retinochoroiditis was observed in 24 women aged 15 to 39 years who were pregnant, in the postpartum period, or lactating. The diagnosis was based on the typical ophthalmoscopic picture of acute toxoplasmic retinochoroiditis and positive serological tests for anti-*T. gondii* IgM and IgG using an ELISA method.

To assess whether pregnancy, postpartum period, or lactation had any effect on the reactivation of toxoplasmic retinochoroiditis, person-time (person-months) was calculated for each of the patients (ie, the number of person-months when pregnant or breast-feeding and the number of person-months since the first episode). The calculations were performed using the following formula:

$$(1/4) \cdot [(number\ of\ pregnancies) \cdot 40 - (40 - Hbd)] + (lactation)$$

where:

1/4 – multiplier needed to express time in months;
number of pregnancies: number of pregnancies, including the present pregnancy;
Hbd: number of weeks of the present pregnancy;
period of lactation: the sum of the duration of present lactation and the mean duration of lactation after previous pregnancies, assuming that the mean duration of lactation was 10 months.

The number of person-months since the last episode was calculated according to the formula:

$$(1/2) [age - (when\ pregnant\ or\ lactating)]$$

This method of calculation was chosen because there was no information available about the first episode of active disease. It was assumed that the first episode could occur at any point between the patient's birth and the time of calculation, which is why the patient's age minus the time when pregnant/lactating was divided by 2. In the case of patients with no retinal scars and no history of earlier attacks, the person-time since the last episode of active disease was zero person-months.

To compare the incidence of the attacks in pregnant/lactating patients versus non-pregnant patients, the Fisher exact test was used. The calculations were performed with WinPepi software (Abramson JH (2004) WINPEPI (PEPI-for-Windows) for epidemiologists Epidemiologic Perspectives & Innovations, 2004, 1: 6).

Results

In a group of 661 patients referred with the diagnosis of acute toxoplasmic retinochoroiditis to the Department of Zoonoses and Tropical Diseases, Medical University of Warsaw and to the Department of Ophthalmology, Medical University of Warsaw during a period of 20 years, there were 213 women of childbearing age. In 24 women aged 15 to 39 years (mean age: 26.5), a total of 28 reactivations of toxoplasmic retinochoroiditis were observed during follow-up (16 episodes in pregnancy, 4 in the postpartum period, and 8 during lactation). In 3 women, multiple attacks were reported (in early pregnancy and the postpartum period in 2 women, and during 2 pregnancies and lactation in 1 woman).

The incidence of toxoplasmic retinochoroiditis episodes in pregnant/lactating women and in non-pregnant women is presented in Table 1.

The risk of recurrence in pregnancy was 7.4-fold higher compared to the non-pregnant/non-breast-feeding state. This correlation was statistically significant at $p < 0.0001$.

Discussion

In our study, we analyzed the medical records of 24 women of child-bearing age who had a total of 28 reactivations of toxoplasmic retinochoroiditis in pregnancy, postpartum period, and lactation during 20-year retrospective observation covering the region of Mazovia in central Poland. The number may seem small but it accounts for 11.2% of all female patients of child-bearing age with reactivation of ocular toxoplasmosis (13.1% of all attacks).

Table 1. The incidence of toxoplasmic retinochoroiditis episodes in pregnant/lactating women and in non-pregnant women.

Period	Person-years	Episodes	Episodes/ person-years	RR (95% CI)	P _{Fisher}
Pregnant/lactating	20.9	28	1.34	7.40 (4.46, 12.06)	<0.0001
Non-pregnant	259.6	47	0.18		

RR – recurrence risk ratio.

The results of statistical analysis demonstrated that the risk of a reactivation in pregnancy, postpartum period, or lactation was 7.4-fold higher than in non-pregnant females in the same age group and the correlation was statistically significant at $p < 0.0001$.

There have been published studies dealing with the statistical assessment of ocular toxoplasmosis reactivation in pregnancy, but observations by other authors cannot be compared with our findings because of the differences in the analyzed data and the use of different statistical formulae [5–7].

Braakenburg et al. based their study on questionnaires and used a regression model for the statistical analysis. They concluded

that the risk of toxoplasmic retinochoroiditis does not increase during pregnancy [6,7].

Additionally, the differences in study results may be accounted for by different study populations and rates of infection depending on the age group [8–10].

Conclusions

Women of child-bearing age with toxoplasma ocular lesions should be informed by their doctors about possible active recurrences during pregnancy and should be followed carefully by an ophthalmologist when pregnant.

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