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Clinical feature and treatment outcome of active ocular toxoplasmosis in immunocompetent patients

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ABSTRACT

Objective: To investigate clinical features, ocular findings, management and follow-up data in a series of immunocompetent patients with active ocular toxoplasmosis. **Methods:** A prospective study of 25 immunocompetent patients with first attack of active ocular toxoplasmosis. Age, gender, clinical presentation and ophthalmic examination finding were recorded. The diagnosis was based on typical finding in ophthalmic examination. Systemic antimicrobials and corticosteroids were given to all patients. The treatment outcome and side-effects of drugs were observed. **Results:** Thirteen (52%) patients were male and 12(48%) were female. The mean±SD age at presentation was (26.8±11.1) years. Eye involvement was unilateral in 92% of patients and bilateral only in 8%. Lesions were located at the peripheral retina in 48%, at the macula retina in 28%, and at the macula and peripheral retina in 24% of the patients. The most common presenting symptom was blurred vision (96%), followed by eye pain (28%). All patients received antimicrobials treatment. Systemic corticosteroids were used in 48% of the patients. Clinical response were observed in 44% 2 weeks before and in 56% 2 weeks after. Vision was improved with treatment except in two cases. No recurrences occurred during one year follow up. **Conclusions:** Our study shows that active ocular toxoplasmosis has no gender predilection and affects young individuals. Unilateral involvement is more common in our study. Response to treatment is good in patients and no recurrences occur during one year follow-up. It may have implications in favor of treatment of active ocular toxoplasmosis.

1. Introduction

Toxoplasmosis is a common infection of human and animals. The disease has a worldwide distribution. The prevalence of infection varies among geographic regions[1]. About 30% of the world's population are estimated to be infected, most of whom experience no overt disease symptoms[2]. The infection is caused by the intracellular protozoan parasite, *Toxoplasma gondii(T.gondii)*[3]. The disease can be congenital or acquired postnataly. Immunocompetent persons with primary infection are usually asymptomatic. It has a variety of clinical manifestations that may range from a subclinical course to a generalized infection with fatal outcome[4].

Toxoplasmosis is one of the most common pathogens to cause intraocular inflammation and chorioretinitis, accounting for 30-50% of all cases of posterior uveitis in the United States[5]. In a large-population based household study in southern Brazil, the incidence of ocular toxoplasmosis was 18%, which is extremely high[6]. Most ocular involvement is believed to be due to congenital infection (80-98%) and experience reactivation in the 2nd and 3rd decades that can present with bilateral eye involvement. Adults with acquired infection usually present with unilateral ocular disease in the absence of prior scarring[7].

The ocular lesions primarily affect the retina. The hallmark of ocular toxoplasmosis is a localized necrotizing retinitis with inflammation of the subjacent choroid, ultimately resulting in characteristic atrophic scars. Lesions may be single but are more commonly multiple often in small clusters and individual lesions in the cluster may be have varied ages[8].

The ocular manifestations of the disease include sudden onset of floaters with blurring of vision, scotoma, pain, photophobia, conjunctival hyperemia and epiphora. Impairment or a loss of central vision occurs when the macula is involved. As inflammation resolves, vision

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improves, frequently without complete recovery of visual acuity. Macular involvement causes loss of central vision[9].

Typical features of toxoplasma chorioretinitis include intensely white focal lesions with an overlying, intense, vitreous inflammatory reaction. With healing, the lesions become pale, atrophy, and develop black pigment. There can also be an associated secondary iridocyclitis and increased intraocular pressure[10].

In reality, the diagnosis of ocular toxoplasmosis has remained mainly clinical by ophthalmological examination, despite the development of serological and other new tests. Serologic tests are positive in a considerable percentage of the general population and are not necessarily indicative of ocular involvement. On the other hand serum antibody titer may not correlate with the presence of active lesions in many patients. Diagnosis is supported by good response to installed therapy[9].

Low titers of IgG antibody are usual in patients with active chorioretinitis due to reactivation of congenital *T. gondii* infection; IgM antibody titer is usually high in the case of acute acquired toxoplasmosis. The conclusive diagnosis of active toxoplasmosis depends on the isolation of toxoplasma from body fluids or tissues, but this is rarely possible in ocular disease[11].

Ocular toxoplasmosis is a self-limiting disease in immunocompetent patients and the lesion usually heals in 6-8 weeks[12]. Treatment most likely indicated in patients with: decrease in visual acuity, macular or peripapillary lesions, lesions greater than one optic disk diameter, moderate-to-severe vitreous inflammation, multiple active lesion and lesions associated with acquired infections. Systemic corticosteroids are indicated when lesion involve the macula, optic nerve head, or papillomacular bundle[10].

The purpose of this study was to investigate clinical features, ocular findings, management and follow-up data in immunocompetent patients with active ocular toxoplasmosis.

2. Materials and methods

Between 2001 and 2010, patients with first attack of ocular toxoplasmosis that were examined in the Eye Clinics of the Semnan University of Medical were enrolled. Only immunocompetent patients were included in the study. All patients underwent a complete ophthalmic examination including slit lamp examination, funduscopy with three-mirror lens (Goldmann, USA) and indirect ophthalmoscopy.

All patients were evaluated by one ophthalmologist. Data were recorded for each patient including age, gender, clinical presentation, ophthalmic examination finding, treatment outcome, and side-effects of drugs. The diagnosis of ocular toxoplasmosis was established by acute onset of visual symptoms, detecting typical toxoplasmic lesions in eye, such as the presence of active, yellow-white, cotton-like patches with indistinct margins of hyperemia with or without a hyperpigmented retinal scar and the detection of positive IgG anti-Toxoplasma antibody. Cases with atypical clinical features were excluded. Complete blood counts were obtained in all patients before treatment. After discussion between specialist of infectious disease and ophthalmologist, treatment was given to all patients because of the severity of disease. Our treatment protocol included pyrimethamine, sulfadiazine and folinic acid for 6 weeks. Patients with lesions in the macular and papillomacular area or with severe vitritis received corticosteroids.

Patients checked at weekly intervals throughout the treatment period for clinical and ophthalmologic response and then every three month until one year. Any complications in therapy were monitored, and a complete blood cell count was performed ones a week.

Statistical analyses were performed by Chi-Square test in SPSS 16.0 computer software. P value <0.05 was considered statistically significant.

3. Results

This prospective observational case series included 25 patients. Of the patients, 13 (52%) were male and 12 (48%) were female. Their ages ranged from 13 to 68 years, with the mean±SD being (26.8±11.1) years. Seventeen (68%) patients were younger than 30 years. The mean±SD time from onset of symptoms until diagnosis was (20.0±16.4) days. In 92% of patients one eye was involved (48% left and 44% right) and only in 8% was bilateral. Lesions were located at the peripheral retina in 48%, macula in 28% and at the macula and peripheral retina in 24% of the patients. The most common presenting symptom was blurred vision (96%), followed by eye pain (28%). And 20% had photophobia and 12% had epiphora.

Of these patients, 12 (48%) received systemic corticosteroid. Clinical response observed in 44% 2 weeks before and in 56% 2 weeks after. A total of 50% patients with corticosteroid and 38.5% with others showed clinical response 2 weeks before that was not significantly different (P=0.561). Complete blood count was within normal limits in all patients at the beginning and during the treatment. One patient developed glossitis and another had nausea and vomiting in first week. Two patients (8%) had visual loss in the first year of treatment. None of the patients had a recurrence during our follow-up period.

4. Discussion

Ocular toxoplasmosis is characterized by self-limited necrotizing chorioretinitis and vitritis. Chorioretinitisis usually is due to reactivation of a congenital infection. Most ocular involvement is believed to be due to congenital infection, however, recent epidemiologic studies showed a higher incidence of acquired ocular toxoplasmosis[13,14]. There are some variations in the clinical manifestations of ocular toxoplasmosis in different parts of the world.

The demographic features of our patients are similar to those reported in other large series[15-17]. Our patients' mean age was (26.8±11.1) years and most of the patients (68%) were younger than 30 years. In our study also, both sexes were equally affected. In Labalette study the distribution of females and males was 59% and 41%, respectively[18].

The disease is uncommon after the age of 50 years. In our patients only one patient was older than 50 years.

Overall ocular toxoplasmosis is bilateral in about 40% of patients. Our findings showed that ocular toxoplasmosis was unilateral in 92% and bilateral only in 8%. Bilateral lesions are more common in the congenital form, while the acquired form tends to be unilateral. We did not have enough information to determine the frequency of either congenital or acquired ocular toxoplasmosis but findings show that most patients in our study may be were acquired. It has been suggested that in some geographic areas acquired infection may account for the majority of cases of ocular toxoplasmosis[9, 19]. In a case series of 16 patients, eye involvement occures in 9 patients (56.2%) was unilateral[20]. In other studies 64.3%[21] and 71%[15] of patients had

unilateral involvement.

The left and right eye was affected near equally in our study. In Labalette study the left eye was affected in 56% of patients[18].

In our study, the most common symptom was blurred vision (96%), followed by eye pain (28%). Similar observations were reported by other authors that blurred vision was the most common symptom[20, 22].

In the present series, lesions were located at the peripherals retina in 48%, macula in 28% and at the macula and peripherals retina in 24% of the patients. Macular involvement was lower in our patients comparing to other study. In 65 patients with active disease localization of the lesion was the macula in 74%, the macula and peripheral retina in 5%, the peripheral retina in 15% and the peripapillary retina in 3 (5%)[15]. In a prospective longitudinal study lesions were located at the macula in 54% of patents[10].

Although the necessity for treatment of ocular toxoplasmosis is still controversial, we decided to treat all patients considering the location of lesions. Also 12 patients received corticosteroid. The results of treating were satisfactory in all cases. Marked improvement was seen in 44% of patients during 2 weeks of therapy. In one study 23 patients with acute toxoplasma chorioretinitis were treated with sulfonamides, pyrimethamine and corticosteroids for a period of 4 weeks. All patients showed clinical improvement within 2 weeks[23]. Although more patients with corticosteroid therapy showed clinical response 2 weeks before but this difference was not significant comparing with those without therapy. Systemic corticosteroid mostly helps to prevention of complications.

The most common complication of ocular toxoplasmosis is visual loss because of macular or optic nerve lesions. In our study 2 (8%) of patients had this complication. In contrast to other study[16,17], this complication rate is low in the present series. The difference may be due to exclusion of atypical severe cases from our study and treatment of all patients.

We found no significant adverse drug reaction during treatment. In agreement with another study in which 62 patients were treated with similar regime, only 4 cases developed gastrointestinal disturbances[22]. So it is concluded that pyrimethamine+sulfadiazine combination is safe for treatment of ocular toxoplasmosis.

There was no recurrence during one year follow-up period in our study. This probably does not mean that the recurrences will not develop but may be due to short follow up time and to the small number of patients. In a study 10.5% of 19 patients without any preexisting scars at initial visit and 26.6% of 90 patients who had scars in at least one eye had recurrences. In patients with recurrences, 65.4% occurred within two years follow-up period[17].

In summary, our study supports evidence that active ocular toxoplasmosis has no gender predilection and affects young individuals in the 2nd and 3rd decades of life. More unilateral involvements show that acquired infections is increasing. Visual prognosis is good in patients and no recurrences during one year follow-up period. It may have implications in favor of treatment of all active typical ocular toxoplasmosis.

Conflict of interest statement

We declare that we have no conflict of interest.

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