BACKGROUND

PREVALENCE OF PAEDIATRIC OCULAR TOXOCARIASIS- A PROSPECTIVE STUDY IN A TERTIARY EYE CARE CENTRE IN SOUTH INDIA

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The objectives of this study are to ascertain the diagnosis of the disease in children, to analyse the clinical profile and to check the response to medical treatment of ocular toxocariasis.

ABSTRACT

MATERIALS AND METHODS

About 30 patients were studied at our institution for 2 years from January 2014 to January 2016. The clinical profile of the patients with ocular toxocariasis was studied and analysed. The primary objective was to study the incidence in children, sex predilection and clinical presentation in 30 cases of ocular toxocariasis. The secondary objective was to determine the visual outcome and fundus changes following medical treatment. All the cases presented were registered, evaluated, and followed up during the study period. A meticulous history of the patient, slit lamp examination, fundus examination were done. Best corrected visual acuity (BCVA) and fundus changes were recorded during presentation and followup period.

Inclusion Criteria- 1. Anti-Toxocara IgG positive cases, 2. Anti-Toxocara IgM positive cases, 3. Age less than 12 years.

Exclusion Criteria- 1. Patients positive for TORCH screening, 2. Patients with connective tissue disorders, 3. Patients with active uveitis due to any other cause.

RESULTS

In our study, majority of patients belonged to the age group of 8-12 years. The youngest patient was 3 years old and the oldest patient was of 12 years. It was observed that this group of population was involved more in outdoor activity. Poor hygiene and close contact with dogs were the most important aetiology. Among the females, poor hygiene and geophagia (Pica) was an important aetiology. 86% of study population had history of contact with pets. All were positive for IgG/IgM Anti-Toxocara antibodies. All patients had classical clinical findings suggestive of toxocariasis and responded well to anthelmintic treatment along with steroid combination.

CONCLUSION

Ocular Toxocariasis is a great masquerade and needs to be considered in the differential diagnosis of Leukocoria, Retinoblastoma, Neuroretinitis and Retinal vasculitis in children. In our study, children treated with anthelmintics and steroid combination showed good visual recovery with minimal sequelae.

KEYWORDS

Ocular Toxocariasis, Peripheral Granuloma, Macular Cyst, Neuroretinitis, ELISA.

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BACKGROUND

Toxocariasis usually affects children, although adults may be affected as well. It presents unilaterally over 90% of the time with defective vision, floaters, strabismus and leukocoria. The most common presentation is a peripheral granuloma with vitritis. A hazy white lesion may be seen in the periphery which is attached to the disc with a glial band. Other common presentations include posterior pole granuloma and endophthalmitis. Optic nerve disease such as papillitis and neuroretinitis are quite uncommon.

Financial or Other, Competing Interest: None. Submission 01-03-2017, Peer Review 13-04-2017, Acceptance 19-04-2017, Published 27-04-2017. Corresponding Author: K. Ravikumar, New No. 6, Old No. 85, Bazullah Road, T. Nagar, Chennai- 600017. E-mail: krkeyedr@gmail.com DOI: 10.14260/jemds/2017/602 As mentioned earlier T. canis is a canine roundworm that shares some similar characteristics with both the feline roundworm T. cati and human roundworm Ascaris lumbricoides. The ingested toxocara eggs emerge in the duodenum; the larva perforates the intestinal wall, enters the circulation and then can lodge in the eye, most commonly in the choroidal circulation. From there the larva can migrate to the subretinal space, vitreous cavity and die after which it is encapsulated by an eosinophilic granulomatous inflammatory reaction.

MATERIALS AND METHODS Materials and Study Design

About 30 patients were studied at our institution for 2 years (January 2014 – January 2016). The clinical profile of the patients with ocular toxocariasis was studied and analysed. The primary objective of the study was to study the incidence of age, sex and clinical presentation in 30 cases of ocular toxocariasis. The secondary objective was to determine the

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visual outcome and fundus changes following medical treatment. All the cases that presented with were registered, evaluated, and followed up during the study period. A meticulous history of the patient including the history of contact with pet, visual acuity, intraocular pressure recording, a detailed slit lamp examination of both the anterior and posterior segment of the eye. Fundus examination was done using a plus 90 D lens and indirect ophthalmoscopic examination was done using a 20 D lens. A thorough workup was done for all the patients by subjecting them to a battery of investigations. Complete investigation like blood count, ESR, Mantoux test, Chest x-ray, B scan, rheumatoid factor, x-ray spine, HLA B27, TORCH screening, serum ACE level, ELISA for cysticercosis and ELISA for toxocara was done before clinching onto the diagnosis. All patients had ELISA (either IgM or IgG) positive for toxocara. Patients were followed up weekly for the first month, twice a month for next 3 months and once in 6 months thereafter. During the followup periods the visual acuity, intraocular pressure, and the fundus changes were recorded and photographed to check for progression/regression.

RESULTS

Age Distribution

- Total number of patients in our study were 30 patients.
- The range was between 3-12 years including both males and females.
- Majority of patients belonged to the age group of 8-12 years of age.
- The youngest patient was 3 years old and the oldest patient was 12 years old

Sex Distribution

In this study, there was a slight male preponderance, males accounting for 60% of patients. Majority of them were in 10-15 years age group.

Laterality

In this study, right eye was affected more commonly than the left eye.

Risk Factors

In our study, it was found that 86% of the total study population acquired the infection due to contact with dogs. Most of them were male children. Females acquired the infection due to geophagia.

Presenting Vision

In our study, it was found that most of the patients presented with defective vision of the affected eye. All of them had a unilateral presentation. The vision range was between 2 to 0.9 in LogMAR units. 14% of the study population had vision ranging from 2 to 1.6, 53% between 1.3 to 1 and 33% had vision ranging between 0.8 to 0.9. The vision drop was significant in those presenting with dense vitritis and posterior pole involvement.



Figure 1. Showing Visual Acuity at the Time of Presentation

Intraocular Pressure

In our study, the intraocular pressure was measured by the standard Goldmann applanation tonometry. 7% of the total study population showed the intraocular pressure slightly on the higher side ranging between 21 – 24 mmHg. These patients were treated with topical 0.5% timolol eye drops twice daily.

Presence of Anterior Uveitis

About 43% of the total study population presented with features of anterior uveitis which include fine fresh KPs on back of cornea, with posterior synechiae, festooned pupil and hypopyon.

Presence of Peripheral Granuloma

In our study, most of the patients presented with peripheral granuloma which constituted for 73% of the total study population.

Presence of Chronic Endophthalmitis

In our study, 7% of total study population presented with chronic endophthalmitis.

Presence of Posterior Pole Granuloma

20% of the children presented had posterior pole granuloma.



Figure 2. Showing Clinical Manifestations

Serology - Elisa Toxocara Antibodies

All the patients were positive for IgG. 17% of the total study population showed an active infection. (Fig. 3)



Figure 3. Showing the Titres of ELISA Toxocara

Post-Treatment Vision

Vision in LogMAR Units	Number	Percentage
2 to 1.6	1	3%
1.3 to 1	14	47%
0.8 to 0.5	10	33%
0.3 to 0	5	17%
Table 1. Showing Post-treatment Vision Improvement		

In our study, it was found that all the patients showed visual improvement except for the patients where macula was involved and those who presented with chronic endophthalmitis. 33% of the study population showed a 2-line improvement on the Snellen chart after 1 month of treatment. 17% of them showed a significant improvement of the vision along significant resolution of fundus changes.

DISCUSSION

In our study, majority of the patients belonged to the age group of 10-12 years of age. The youngest patient was 3 years old and the oldest patient was of 12 years. It was observed that this group of children were involved more in outdoor activity. Poor hygiene and close contact with dogs were the most important aetiology. Among the females, poor hygiene and geophagia (Pica) was an important aetiology. 86% of study population had history of contact with pets.

A slight male preponderance of 91% was observed in this study. Most cases evaluated presented with the unilateral involvement. The right eye was most commonly affected.

All the patients presented with defective vision of the affected eye. All of them had a unilateral presentation. The vision range was between counting fingers close to the face to 6/18. The vision drop was significant in those presenting with dense vitritis and posterior pole involvement. 2% of the population presented with white reflex in the pupillary area had a gross loss in vision.

43% of the total study population presented with features of anterior uveitis which include fine fresh KPs on back of cornea, with posterior synechiae, festooned pupil and hypopyon.

73% presented with peripheral granuloma, 7% with chronic endophthalmitis and 20% with posterior pole granuloma.

17% of the total study population showed an active infection. 33% of the study population showed a 2- line improvement on the Snellen chart after 1 month of treatment.

17% of them showed a significant improvement of the vision along with significant resolution of fundus changes.

Eyes with toxocariasis can be treated medically or surgically, depending on the severity of intraocular inflammation and comorbid conditions. First, medical therapy should be considered in cases of active inflammation. Current standard treatment for ocular toxocariasis is corticosteroid administration in patients with active intraocular inflammation. Topical and systemic corticosteroids are useful in managing intraocular inflammation and may reduce vitreous opacification and membrane formation. This protocol of treatment was adopted in our study as well.

The role of anthelmintic therapy in OT remains controversial as there have been no randomised controlled trials on the use of anthelmintic agents for OT. The results from only a few controlled trials of anthelmintic drugs for systemic toxocariasis have been published.^[1] Since parasitological cure cannot be assessed exactly, the outcome used in the published trials has simply been an improvement in the clinical signs and symptoms. Albendazole (400 mg given twice a day for 7-14 days) is the recommended standard drug for systemic toxocariasis. However, it is not proven that the anthelmintic therapy can kill intraocular Toxocara larvae as intraocular pharmacokinetic and pharmacodynamic studies on anthelmintic agents have not been performed. Therefore, the role of anthelmintic therapy in OT remains unclear. Nonetheless, the use of anthelmintic drugs combined with corticosteroids has shown favourable outcomes in our study when compared to other studies like Barisani-Asenbauer et al.²

Challenges Encountered during Study

3 patients in the study showed an atypical presentation of Toxocariasis-

- 1. Rarer presentations like Neuroretinitis were also seen in one of the cases. (Fig. 5a)
- 2. A 5-year-old male child presented with an exodeviation of the affected eye which was of recent onset. On fundus examination, there was a macular cyst which was a rare presentation. The sensory exotropia recovered on treatment but with residual of 10 PD. (Fig. 5b).
- 3. A 10-year-old male patient presented with multiple chorioretinal patches, inferonasal to disc with contiguous vasculitis.



Figure 5a. Showing Macular Star Figure 5b. Showing Macular Cyst

These cases presented a diagnostic dilemma. The serum antibody titres were helpful in clinching the diagnosis towards toxocariasis and on starting the patients on appropriate treatment.

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Toxocara canis/cati are parasitic nematodes that reside in the small intestine of dogs, cats and wild carnivores.³ Human infection is due to accidental ingestion of infective eggs and tissue invasion of second stage Toxocara cati or canis larvae.4 Transmission is by contaminated food or by geophagia. Clinical spectrum of toxocariasis in humans varies from asymptomatic infection to severe organ injury, depending on the parasite load, the sites of larval migration, and the host's inflammatory response. Majority of patients with ocular toxocariasis present with blurred vision, pain, photophobia and floaters.⁴ Severe vision impairment was more common in the lesions involving the macula. However, studies show that the major causes of visual acuity loss are- severe vitritis (52.6% of the cases), - cystoid macular oedema (47.4%) and tractional macular detachment (36.8%). In Asia, one study showed that Ocular Toxocariasis accounted for 1.1% of all uveitis cases.⁵ In the past, most Ocular Toxocariasis cases were considered to develop in paediatric patients.

Ocular manifestations of T. canis vary greatly and may include disciform macular detachment, multifocal granulomas, retinal tracks, peripheral retinal detachment, papillitis, peripheral retinal mass, pars plana mass, vitritis, endophthalmitis, and cataract.6 However, to our knowledge, retinal vasculitis has not been previously described in patients with ocular Toxocariasis. Although the mainstay treatment for Ocular Toxocariasis is the use of corticosteroids to reduce ocular inflammation, this treatment has not yet been standardised. Therefore, we recommend using both corticosteroids and albendazole to minimise severe, recurrent inflammation and associated retinal damage.

Atypical presentations include inflammation and swelling of the optic nerve head (manifesting as optic neuritis), motile subretinal larvae,^{6,7} and diffuse chorioretinitis,⁸ BRVO, vitreous haemorrhage, scleritis. Anterior segment findings such as conjunctivitis, keratitis, iridocyclitis, focal iris nodules, and cataract can also be observed.^{9,10}

CONCLUSION

Ocular Toxocariasis is a great masquerade and needs to be considered in the differential diagnosis of Leukocoria, Retinoblastoma, Neuroretinitis and Retinal vasculitis in children. Evaluation for constitutional symptoms of T. canis infection as well as laboratory workup including T. canis ELISA and complete blood count assist in diagnosis. Treatment with anthelmintic agents and systemic steroids hasten recovery of ocular symptoms and funduscopic findings, and prevent irreversible vision loss and recurrence.

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