ORIGINAL RESEARCH PAPER

Ophthalmology

KEY WORDS: Cysticercosis, Extraocular Muscle, Proptosis, Subretinal Cyst, Albendazole.

CLINICAL SPECTRUM OF OCULAR AND EXTRAOCULAR CYSTICERCOSIS

Dr. Pooja Baisoya Subharti Medical College, Meerut

Dr.Mohit Kumar* Subharti Medical College, Meerut, *Corresponding Author

ABSTRACT

AIM : To study the clinical profile of ocular and extraocular cysticercosis.

Material and Method: A total of 10 patients were recruited for this study. Radiological investigations in form of ultrasonography and computed tomography were done for all the patients. Treatment was given according to the location of the cyst.

Results: The commonest clinical presentation was restriction of extraocular movements, proptosis, followed by subconjunctival cyst, papilloedema, subretinal cyst and intraretinal cyst.

Conclusion: Cysticercosis is a common parasitic condition which may manifest as ocular or extraocular disease. Treatment depends on the site of lodgement.

INTRODUCTION

Cysticercus cellulosae is the larval form of the pork tapeworm Taenia solium,it is the most common parasite in which humans acts as the intermediate hosts. Cysticercus cellulosae may become encysted in various body tissues, usually the eyes, central nervous system, and subcutaneous tissues. It is usually the most common parasitic disease of the central nervous system. However, in the orbital cysticercosis extraocular muscle involvement is most common and intraocularly vitreous, sub retinal space followed by subconjunctival tissue are more commonly involved. The mode of human infection is consumption of raw or inadequately cooked infected pork, consuming food or water contaminated with faecal matter containing the ova, or due to auto-infection. Cysticercosis is a serious problem in developing countries, especially in areas of poverty and poor hygiene.

This prospective study was conducted with the aim of analyzing the demographic factors, clinical diagnosis, results of investigation, modalities of treatment and their outcome. Early diagnosis and management of cysticercosis is important to improve the quality and span of life. If not treated , the parasite dies after few years releasing toxins inducing intense inflammatory reaction and could lead to dreadful sequelae and severe neurological complications.

Material and Methods

This prospective study was conducted over a period of one year from June 2016 to June 2017, in which 10 patients with ocular and orbital cysticercosis were recruited. Patients included were from the ophthalmology outpatient department and those referred to the oculoplasty clinic of our hospital.When the patient presented for the first time their demographic profile, history regarding symptoms and duration of onset, course of the disease, eye involvement, effect on the visual status after the onset of symptoms and at presentation, previous investigation and treatment was noted. Detailed ophthalmic examination including the slit-lamp examination and indirect ophthalmoscopy for involvement of anterior and posterior segment respectively, was performed for all the patients. Patients were also evaluated by general physician and neurologist.

All the relevant clinical tests were performed including diplopia charting, Hertel's exophthalmometry, ptosis work up, and electrophysiological tests. A and B scan (ultrasonography eye and orbit) and computed tomography with 2 mm optic nerve cuts, head and orbit ,axial and coronal cuts were done and their finding were noted. A scan showed high amplitude spikes corresponding to the cyst wall and scolex , B scan ultrasonography showed hanging drop sign i.e. echoes corresponding to the cyst with the scolex attached to the inner wall (Fig 1). A non-enhanced circular area of low attenuation with a tiny area of increased attenuation within the lesion was seen on CT scan (Fig 2).

On the basis of radiological investigations, confirmation was done and medical therapy was started based on the location of cyst. Medical therapy consisted of oral Albendazole (15 mg/kg body weight per day in two divided doses) in conjunction with oral prednisolone (1.5 mg/kg body weight per day in a single dose) over 1month period. Low dose oral prednisolone was continued till the inflammation of surrounding tissue also subsided. It was observed that cysts without scolex responded better to medical therapy. Once there was no radiological evidence of cyst, the oral steroid was also tapered and stopped. Cysts which doesn't respond or resolved with medical therapy, surgical treatment was done. Follow-up was done at 1 week, 2 week, and then monthly thereafter. Serial ultrasound was done at monthly intervals to monitor the status of the scolex and inflammation of surrounding tissue in patients showing cyst with scolex on USG . When the scolex was completely eradicated or patient was free of the presenting complaints it was considered recovery.

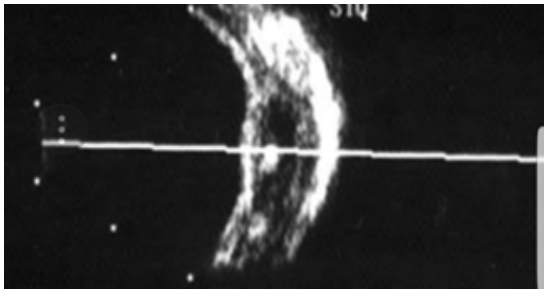

Fig 1-Bscan image of cysticercosis

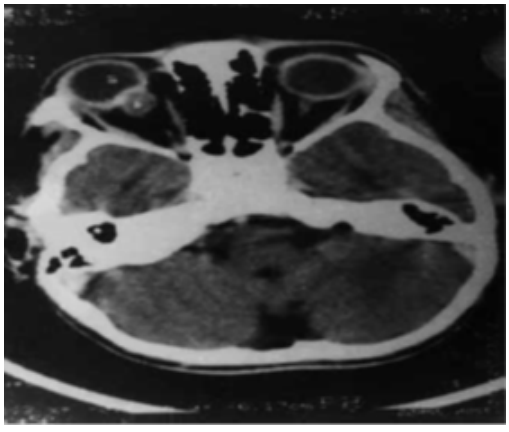

Fig 2 CT scan showing cyst in the muscle

RESULTS

Table 1. Summary of patients Total of ten patients were enrolled in this study (Table 1).

S	Age	Sex	veg/	presenation	Duration	BCVA		Radiological evidence		Structure involved T/T	T/T
	(yrs)		nonveg		(mnths)	RE	LE	USG	CT		

1	23	F	nonveg	subconj cyst	8	6/6	6/6	present	present	Subconjunctiva medical	medical
2	5	M	nonveg	subconj cyst	6	6/6	6/6	present	not visible	Subconjunctiva surgery	surgery
3	32	M	veg	cyst in AC	3	6/6	6/9	present	not visible	AC / MR surgery	surgery
4	10	F	veg	ptosis	20	6/9	6/6	present	present	SR medical	medical
5	12	F	nonveg	ptosis	17	6/6	6/6	present	present	SR medical	medical
6	41	M	nonveg	papilledema	3	6/12	6/18	present	present	Retrobulbar medical	medical
7	50	M	nonveg	proptosis with R	18	6/6	6/6	present	present	LR medical	medical
8	30	M	nonveg	subretinal cyst	2	PL+ PR accurate	6/6	present	present	subretinal space surgery	surgery
9	25	M	nonveg	intraretinal cyst	5	6/6	PL+PR accurate	present	present	Vitreous surgery	surgery
10	38	M	nonveg	proptosis	22	6/6	6/9	not visible	not visible	MR medical	medical

Table 1. Summary of patients

S=serial number, Yrs=years,M=male,F=female,BCVA=best corrected visual acuity,Mnths=months,AC= anterior chamber,LR=lateral rectus,MR=medial rectus,SR=superior rectus,R=movement restriction,PL=perception of light,PR= projection of rays.

Male predominance (70%) was observed. Mean age of the patients was 26.6 years. Out of 10 patients, 9 patients had unilateral involvement. Mean duration of onset was 10.4 months. Patients with extraocular muscle involvement presented with globe protrusion, pain and diplopia whereas patients with intraocular cysts presented predominantly with dimunition of vision. Subconjunctival cysts led to swelling, redness and pain. Out of 10 patients, 5 patients had orbital cysticercosis and 4 patients had ocular cysticercosis, 1 had both ocular and orbital cysticercosis. The clinical presentations were proptosis (2), with restricted ocular movements (1) subconjunctival cyst (2) Fig 4, acquired ptosis (2), anterior chamber cyst (1) Fig 3, subretinal cyst with macular scarring (1), intraretinal cyst (1) Fig 5, papilloedema (1) (Table 2).

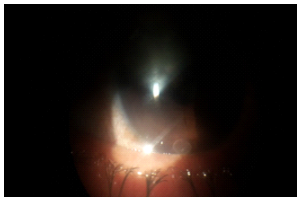

Fig 3 Cyst in anterior chamber

Fig 4 Subconjunctival cyst

Table 2

Sno.	Presentation
1	subconj cyst
2	subconj cyst
3	cyst in AC
4	ptosis
5	ptosis
6	papilledema
7	proptosis with R
8	subretinal cyst
9	intraretinal cyst
10	proptosis

Visual acuity was affected in 6 patients, out of which 2 had posterior segment involvement. Radiological evidence in the form of either USG or CT scan was present in all patients except one who had intraretinal cyst.

The extraocular muscles were the commonest structure to be affected in the orbit. Medial and superior rectus involvement was observed in 2 patients each followed by lateral rectus in 1 patient. All patients with intraocular cyst were diagnosed clinically and on the basis of radiological investigations. CT scan and ultrasound was done on these patients which revealed intraocular cysts with scolex. Treatment was individualized according to the location of the cyst. Majority of the patients received medical therapy and 4 patients underwent surgical treatment and had a good outcome. Patients were kept on follow-up in the ophthalmology department as well as in neurology department. Recurrence was not observed. In patients undergoing surgical removal, histopatholgical examination was done and cyst with scolex was confirmed by histopathological examination.

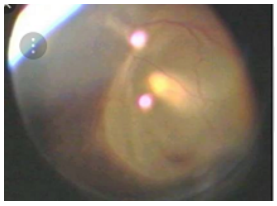

Fig 5 Fundus photo of Intravitreal cyst

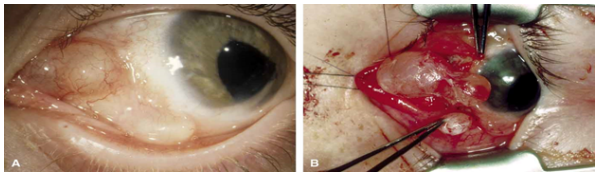

Fig 6 Preop and intra-operative images of subconjunctival cysticercosis

Discussion

The majority of patients in this study were males with unilateral involvement. Presentations varies from proptosis, ptosis, papilledema, subconjunctival cysts, intravitreal cyst, subretinal cyst and anterior chamber cyst. Literature on myocysticercosis reveals inconsistent results on the commonest site of cyst lodgement. Some studies suggest involvement of inferior and medial rectus more common as compared to other extraocular muscles. However, the cyst may lodge in any of the extraocular muscles.[1]Visual acuity remain unaffected in cases of muscle involvement as toxic myositis or inflammatory reaction in the surrounding tissue is not so common. The intra-ocular manifestations leads to blindness in approx 3-5 year due to increase in the cyst size.[2] Medical therapy including oral albendazole with steroid is the main modality for the

management of myocysticercosis, therapy must be individualized according to the location of the parasite and tailored depending on the activity of the disease.Before starting cysticidal drugs it is important to have CT scan of the head done to rule out intracranial cysts as these agents provoke inflammatory response around residual, dying cysticerci. [3] In patients with associated cysticercosis of the brain, the patient should be hospitalized and the cysticidal drug administration should be under neurological supervision.A high dose of corticosteroids should also be added.

Conjunctival involvement is usually in the form of a painless or painful yellowish, nodular subconjunctival mass with surrounding conjunctival congestion. Subconjunctival presentation could be due to spontaneous extrusion of cyst from extraocular muscle into the subconjunctival space. Recommended treatment for subconjunctival cysts is excisional biopsy after a course of topical steroid to reduce the inflammation. If the cyst wall is opened intraoperatively, the content should be aspirated and the area should be irrigated with hypertonic saline.[4,5]

Intraocular cysts are managed by complete surgical removal. However vision may not improve due to pre-existing macular scarring .When imaging modalities were compared for detection of scolex USG was found superior to CT scan. However CTscan (head) is mandatory to rule out associated neurocysticercosis.

Albendazole is a well tolerated broad spectrum cysticidal drug used in the treatment of cysticercosis. Success rate with a single dose of albendazole range from 60 to 85% . Albendazole is converted to its active metabolite, albendazole sulphoxide in the liver. Usual dose is 15 mg/kg per day with a maximum of 400 mg/BD with repeated dosings as clinically required. In some patients expected cure is not seen owing to unpredictable serum and brain levels of the drug. Absorption of albendazole is increased with fatty foods.Treatment may increase inflammation as the cyst involutes after 2-5 days of therapy leading to worsening. Thus, concomitant administration of corticosteroids is recommended to avoid an inflammatory response.[6]

Corticosteroids decreases elimination of albendazole sulphoxide . Orbital cysts are best treated conservatively with a 4-week regimen of oral albendazole (15 mg/kg/d) in conjunction with oral steroids (1.5 mg/kg/d) in a tapering dose over a 1-month period.[7]

Serial B-scan ocular ultrasonography or CT scan of the orbit helps to follow the resolution of the cyst. Appropriate sanitation and personal hygiene measures can prevent cysticercosis thus, frequent hand washing ,washing raw vegetables and fruits well before consumption can prevent fecal-oral transmission. Raw and improperly cooked food should be avoided, especially in endemic areas.

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