Ocular manifestations in paediatric HIV positive patients with respect to CD4: CD8 counts in a tertiary care hospital in North Karnataka

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Abstract

Aim: To describe various ophthalmic manifestations in HIV positive paediatric population enrolled at Anti Retroviral Therapy (ART) Centre with respect to CD4:CD8 counts.
Materials and Methods: A cross sectional hospital based study at Department of Ophthalmology and ART Centre in a tertiary care hospital of paediatric HIV positive individuals was done between Oct 2012 to April 2013. Parents/caretakers of the children were interviewed to obtain socio-demographic data and a general physical as well as a comprehensive ophthalmic examination were conducted to document any ocular problems with respect to their CD4:CD8 counts.
Results: Out of 68 HIV seropositive children 27 were males and 41 females. Posterior segment complications were common in patients with CD4+ counts < 200. The most common ocular lesion was dry eyes (10.88%), allergic conjunctivitis (7.48%), bitot spots (4.76%), blepharitis (3.4%), molluscum contagiosum (1.36%) and perivasculitis (1.36%). Five children had simple myopia. 90% of the parents / caretakers were below poverty line and most of them were illiterates.
Conclusion: Manifestations of HIV infection are less common in children compared to adults. Cotton wool spots and cytomegalovirus retinitis, the most common ocular manifestations of HIV/AIDS are much less prevalent in children.

Key words: paediatric HIV positive, CD4:CD8, dry eyes.

lntroduction

Acquired Immuno Deficency Syndrome (AIDS) was first recognized in India in 1986 [1,2]. India harbours the world's second largest burden of HIV infected with one of every 6 new HIV infections occurring in India and 2 Indians becoming HIV infected every minute [3]. Ocular complications are common in HIV/AIDS, affecting 50%-75% of patients at some point during the course of illness [4]. Life time cumulative risk of at least one abnormal ocular lesion developing among HIV positives ranges from 52% - 100% [5].

Data available from developed countries indicate that the pattern and prevalence of HIV related ocular disease in the paediatric population is different from adult patients. In order to assess the type and prevalence of ocular involvement in paediatric HIV/AIDS patients at a tertiary care hospital in North Karnataka, a study was conducted at the Ophthalmology Department in association with A R T Centre.

Materials and Methods

A cross-sectional descriptive study was done in which HIV positive paediatric patients were assessed for ocular manifestations with respect to CD4:CD8 counts were consecutively examined and documented. A total of 68 paediatric HIV positive patients were examined at Ophthalmology Department, in a tertiary care hospital between October 2012 to April 2013.

Inclusion Criteria

Children with HIV seropositive < 15 years old enrolled at ART Centre who were not on ART therapy i.e., pre-ART stage. Exclusion Criteria: Children who were too sick to undergo detailed physical and ocular examination. Written consent was obtained from parents/caretakers of children who participated in the study and Ethical Committee clearance was obtained.

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Table 1. Age and sex distribution

Age in years	Male	Female	Total
<5	13	20	33
6-10	7	14	21
11-15	7	7	14
	27	41	68

Parents/caretakers were interviewed to obtain socio-demographic data of each child. This was followed by general physical examination by the Paediatrician and then an ophthalmic examination. Each patient underwent a complete ophthalmic examination which included vision, external ocular examination, slit-lamp examination, fundoscopy by Indirect Ophthalmoscopy after dilatation of pupils. Abnormal findings were documented and relevant laboratory and radiological investigations were carried out along with CD4 and CD8 counts. Reference was made to each patient's case notes to ascertain any systemic condition in the past like tuberculosis, pneumocystitis carinii pneumonia, diarrohea, ear, nose and throat infections etc.

Results

In a total of 68 children, 52 children had a single examination, while 16 patients were examined twice. The average rate of ophthalmic involvement was 35.29 %(24/68).

Table 2. Parental living status and HIV seropositivity

Sl. No	Parental status	No. of parents
Alive single parent HIV +	Father 1 Mother 20	21
Alive single parentsHIV -	Father1 Mother 1	2
Alive couple parents HIV +	Father 34 Mother	34
Alive couple parent with one of the spouse HIV -	Father 4 Mother 2	6
No parent	Care taker 5	5

90 % of the parents of the HIV infected children were below poverty line with income ranging from1000 to 2000 rupees per month. Most of the parents were illiterates.

Table 3. CD4 and CD8 count status of HIV positive children at the time of examination

CD4 + count / microL	No. of HIV positive children	Ocular manifestations(No. of patients)
< 200	4	Retinochoroiditis(1), perivasculitis(2), Herpetic keratitis(1)
201 500	28	Molluscum contagiosum(2), Blepharitis(5), corneal opacity(1), conjunctival microangiopathy(2)
501 1000	26	Bitot spots(7), Hordeolum externum(3), allergic conjunctivitis(11), dry eyes (16), Hordeolum internum(2)
>1000	10	----

Table 4. Oocular manifestations in HIV positive children

Sl. No.	Ocular finding	No. of patients (% of prevalence)
	Anterior segment/Adnexal lesion	
1	Conjunctival xerosis/Bitot spots	7 (4.76)
2	Non purulent conjunctivitis	2 (1.36)
3	Allergic conjunctivitis	11 (7.48)
4	Blepharitis	5 (3.4)
5	Hordeolum externum	3 (2.04)
6	Molluscum contagiosum	2 (1.36)
7	Chalazion	2 (1.36)
8	Dry eyes	16 (10.88)
9	Hordeolum internum	2 (1.36)
10	Herpetic keratitis	1 (0.68)
	Posterior segment lesion	
11	Retinochoroiditis	1 (0.68)
12	Perivasculitis	2 (1.36)
13	CMV retinitis	0

Five children had refractive error in the form of simple myopia and were prescribed appropriate spectacle.

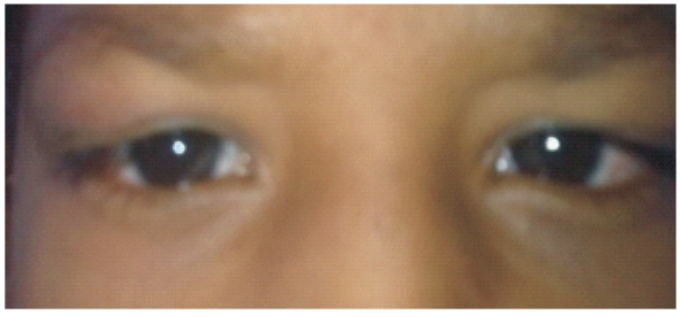

Figure 1.Hordeolum internum

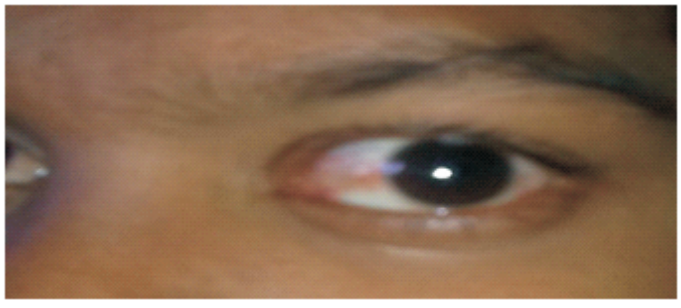

Figure 2. Pterygium

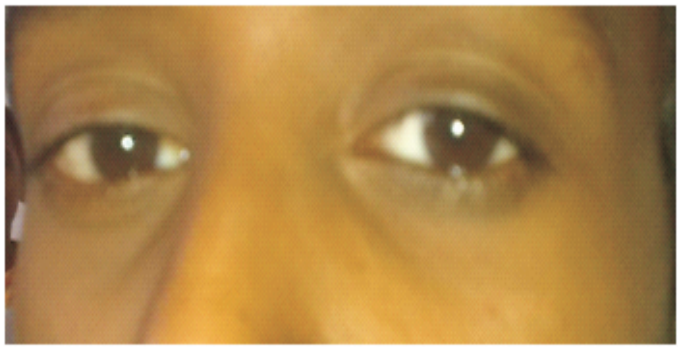

Figure 3. Lid margin pigmentation (left eye)

Figure 4. Non purulent conjunctivitis

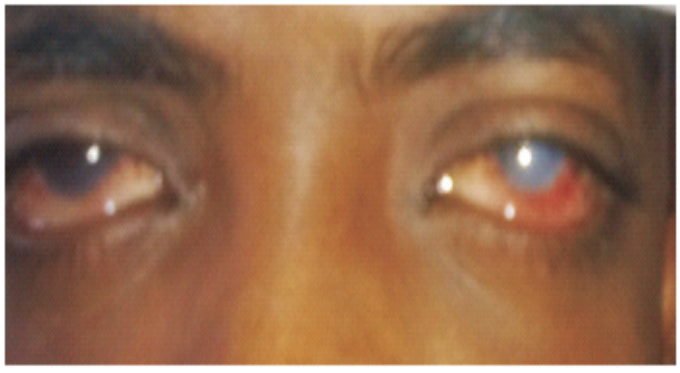

Figure 5. Herpetic keratitis

Figure 6. Allergic conjunctivitis

Discussion

Since 1981, when the first case of acquired immunodeficiency syndrome AIDS was diagnosed, the number of cases of human HIV infection has been continuously increasing around the world. In India the first cases of HIV were diagnosed among sex workers in Chennai, Tamil Nadu by Simoes et al., in 1986.

Among adults with HIV/AIDS, the incidence of ocular manifestations is high [6], varying between 50% and 90%. However, the incidence in paediatric patients is lower. In our study, the incidence of ocular manifestations was (35.29 %). Biswas et al [7] in their study ocular lesions were found in 50% of patients. Dennehy [8] reported an incidence of 20%, whereas Kestelyn et al [9] reported an incidence as 54%, Ikoona et al [10] reported an overall rate of ophthalmic involvement to be 35%.

In our study, the most common ocular lesion (Table 4) was dry eyes (10.88%), allergic conjunctivitis (7.48%), bitot spots (4.76%), blepharitis (3.4%), molluscum contagiosum (1.36%), and perivasculitis (1.36%). Biswas et al [7] reported that the spectrum of ocular lesions in children with HIV infection is different from that seen in adults. The most common ocular lesions were anterior uveitis and CMV retinitis (33%), followed by retinal detachment (16.66%) and vitreous haemorrhage. Kestelyn et al [9] reported most common finding to be perivasculitis of the peripheral retinal vessels (38%), CMV retinitis (3 patients), ophthalmic herpes zoster and conjunctival xerosis (2 patients each). They concluded that cotton wool spots and CMV Retinitis, the most common ocular manifestation of HIV/AIDS in adults, are much less prevalent in children. Ikoona et al [10] reported most common finding as a non-purulent conjunctivitis (12%), followed by perivasculitis of peripheral retinal vessels (12%) and molluscum contagiosum. Girard et al [11] divided retinal manifestations as venous dilatation & perivasculitis and retinal opportunistic infection. Ocular toxoplasmosis was the main finding. They also reported one case of herpetic keratitis.

None of our patients presented with isolated cotton wool spots, which constitute the most frequent ocular manifestation of HIV infection in adults. No isolated cotton wool spot were reported by Ikoona et al [10] and Kestelyn et al [9] as well.

CMV and other infections (tuberculosis, toxoplasmosis, cryptococcosis) are less likely to develop in children because they have not yet been infected with these organisms, unlike adults in whom reactivation of potent infections occurs when the immune system deteriorates [12].

Adnexal / external ocular lesions were common in our study like Vitamin A deficiency, molluscum contagiousum, corneal involvement, dry eyes, allergic conjunctivitis (Figure 6) hordeolum internum (Figure 1), etc. Dry eyes were detected by abnormal Schirmer test. There was a single case of herpetic keratitis (Figure 5) who was a 14 year old boy with visual acuity 6/60 in right eye and counting finger 1 metre in left eye with significant corneal opacity and vascularization. The patient is being treated and followed up. One child had unilateral lower lid margin pigmentation (Figure 3), the cause of which is unknown and the patient will be followed up in subsequent visits. Among 11 cases of allergic conjunctivitis, 3 had vernal keratoconjunctivitis and remaining had seasonal allergic conjunctivitis. Two patients had non purulent conjunctivitis (Figure 4). Increased number of dry eyes may be related to summer season and few cases with associated meibominitis.

There was a single case of unilateral pterygium (Figure 2) in a 8 year old boy with no positive family history and visual acuity of 6/6 and was managed conservatively. Monga.S [13] concluded that development of pterygium is a possibility in younger age groups. No specific predisposing factors, either environmental or familial were identified as contributing to childhood pterygium. Ikoona et al [10] reported 14 children with Vitamin A deficiency, ocular Nerve palsies (5), molluscum contagiosum and corneal involvement. Kestelyn [9] reported 1/3rd of subset of children tested for lacrimal function had evidence of decreased tear secretion, ophthalmic herpes zoster and conjunctival xerosis (2 patients each). Girard et al [11] reported adnexal complication in the form of conjunctivitis and molluscum contagiosum.

People with lower literacy and from poor families have higher risk of HIV [14]. 15 million children have been orphaned by HIV/AIDS worldwide who are at an increased risk of malnutrition, illness, abuse and sexual exploitation [14,15]. In our study 90% of parents/caretakers were below poverty line and most of them were illiterates.

Manifestations of HIV infection in children appears to be different from adults. Our data, in agreement with other reports in the literature, indicate that cotton wool spots and cytomegalovirus retinitis, the most common ocular manifestations of HIV/AIDS are much less prevalent in children. Instead we found dry eyes, allergic conjunctivitis and vitamin A deficiency were commonly seen. There is increased prevalence of Vitamin A deficiency in children indicating the need for Vitamin A prophylaxis for children < 5 years old every six months.

Kuppermann et al performed a correlation between CD4 cell counts and prevalence of CMV retinitis and HIV related non-infectious retinal vasculopathy in patients with AIDS. In patients with CD4 cell counts of 50cells/mm [3] or less, 45% had HIV related non-infectious retinal vasculopathy, whereas 16% patients with CD4 cell counts of 50cells /mm [3] or more were noted to have these changes. They concluded that CMV retinitis and HIV related non-infectious retinal vasculopathy are late manifestations of AIDS, with an increased risk in patients with low CD4 cell counts. In our study low incidence of posterior segment lesions is related to few patients with very less CD4 counts (only 4 children had CD4 count <200). Since children with lower CD4 counts are susceptible to posterior segment complications (Table 3), there is a need to evaluate and screen these HIV positive children at regular intervals and treat appropriately.

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References

1. John TJ, Babu PG, Jayakumari H, Simoes EA. Prevalence of HIV infection among risk groups in Tamilnadu, India. Lancet 1987; 1:160-1.

2. Simoes EA, Babu PG, John JJ, Nirmala S, Solomon S, Lakshminarayan CS et al. Evidence for HTLV-III infection in prostitutes in Tamil Nadu (India). Indian J. Med Res. 1987;85: 335-8.

3. Bollinger RC. Stop AIDS – Keep the promise. Indian J Med Res 2005;121: 209-10

4. Vrabec TR. Posterior segment manifestations of HIV-AIDS. Surv Ophthalmol 2004;49:551-7.

5. Biswas J. Acquired Immunodeficiency Syndrome and the eye. J. Assoc Physicians India 2001; 49:551-7.

6. Balacco GC, Agarano G. Ocular manifestations in HIV seropositive patients. Ann Ophthalmol. 1990 May; 221(5) : 173-176.

7. Jyotirmay B, Aman A K, Amala EG, Madhavan HN, Kumarasamy N, Mothi SN et al. Indian J Pediatr, 2000; 67(10): 721-4.

8. Dennehy Ocular manifestations in paediatric patients with Acquired Immunodeficiency Syndrome. Arch Ophthalmol. 1989; 107(7) :978-82.

9. Kestelyn P, Lepage P, Kavita E, Vande Perre P.Ocular manifestations of infection with the human immunodiefiency virus in an African pediatric population. Ocul. Immunol Inflamm. 2000; 8(4): 263-73.

10. Erick Ikoona, Israel Kalyesubula, Medi Kawuma. Afr. Health Sci. 2003; 3(2): 83-6.

11. Girard B, Prevost MG, Courpotin C, Lasfargues G. Ophthalmologic manifestations observed in a paediatric HIV seropositive population. J. Fr Ophthalmol. 1997; 20(1): 49-60.

12. Lepage P, Hitimana DG. Natural history and clinical expression of HIV infection in infants and children. AIDS. 1991; (5) Suppl:113-121.

13 Monga S, Gupta A, Kekunnaya R, Goyal S, Vemuganti GK, Sachdeva V.Childhood pterygium: a descriptive study of 19 cases presented to a tertiary eye care center.Am J Ophthalmol. 2012 Nov;154(5):859-864.

14. Tran TM, Nguyen HT, Yatsuya H, Hamajima, Nishimura A, I to K. HIV prevalence and factors associated with HIV infection among male injection drug users under 30s. A cross sectional study I Long An, Vietnam. BMC Public Health 2006 ; 6:248.

15. Hecht R, Alban A, Taylor K, Post S, Anderson NB, Schwarz R. Putting it together. AIDS and the millennium development goals. PLOS Med 2006; 3:455.

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