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OCULAR INVOLVEMENT IN LEPROSY PATIENTS.

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ABSTRACT

Background: The anterior segment of the eye and ocular adnexa are ideal sites for Mycobacterium leprae to proliferate. The cooler temperature, presence of a rich neurovascular network and possibility of ocular immunologic compartmentalization may be incriminated as the contributing factors to ocular complications of leprosy.
Ocular complications can occur at any stage of the disease despite the treatment and even after treatment is completed.

Aims and objectives:

- To study the different ocular manifestations in patients with leprosy.
- To identify potentially sight threatening lesions and provide appropriate management.

Materials and methods: The study was done in 75 patients of leprosy visiting dermatology department of a Rural Medical College. After taking written informed consent and recording relevant history, comprehensive general and systemic examination was carried out. Thorough ocular examination was done. Ocular adnexa, extraocular structures and lacrimal sac were carefully examined.

Observations and results: All types of leprosy had ocular involvement. Out of the 75 cases of leprosy studied, ocular involvement was seen in 34 cases (45.33%).Male predominance was seen in both, the number of patients with leprosy and those who had ocular involvement. The ocular involvement increased with increase in the duration of leprosy. Potentially sight threatening lesions seen were seen in 23 patients(67.64%).

Summery and conclusion: The anti-leprosy treatment though has markedly improved the outcome of those affected; ocular involvement can be seen even after completion of anti-leprosy treatment. Many problems can be prevented with early detection and appropriate management.

Keywords: Leprosy, Mycobacterium lepare, Ocular involvement in leprosy

Introduction

Ocular problems are seen in leprosy patients before, during and even after completion of anti-leprosy treatment.The eye involvement is seen in anywhere. Between 15% in tuberculoid to100% in lepromatous cases .The anterior segment of the eye and ocular adnexa are ideal sites for Mycobacterium leprae to proliferate. The cooler temperatures, presence of a rich neurovascular network and possibility of ocular immunologic compartmentalization may contribute to ocular complications of leprosy.(1)

Leprosy affects the eye in many ways. By direct invasion by the bacteria that reach the

ciliary body by way of blood stream and spreading to adjacent structures. There may be involvement of facial and trigeminal nerves and there may be hypersensitivity reaction to bacterial breakdown products. Ocular involvement could also be secondary to changes in lids and the lacrimal drainage system.

Lesions like lagophthalmos, exposure and neurotrophic keratitis, uveitis and cataract are potentially sight –threatening and need prompt management.(2).In order to detect and manage the ocular problems in leprosy this cross-sectional, descriptive, observational study was done at a Rural Medical College Hospital during the period April 2014 to March 2015.

MATERIALS AND METHODS

Patients of leprosy visiting dermatology department of a Rural MedicalCollege and also those residing at a nearby leprosy home during the periodwere included after determining the sample size with the help of statistician and approval by ethics committee. Seventy five patients were enrolled after written informed consent.

After recording relevant history, a comprehensive general and systemic examination was carried out.

A thorough ocular examination was done.Silt lamp bio-microscopy was used for detailed examination of anterior segment. Fundus was evaluated using 78 D and 90 D lens on slit lamp and direct and Indirect Ophthalmoscope. Intraocular pressure was measured using Goldmanapplanation tonometer.Conjunctival smear examination to detect lepra bacilli using Zeil-Nelson staining was carried out in all patients. Relevant laboratory investigations were done as and when indicated.

All findings were documented.Systemic anti-leprosy treatment and treatment of lepra reaction was continued as advised by the dermatologist attending the patient. Specific treatment was administered for ocular problems. Spectacle correction was given to correct refractive errors.Patients with lagophthalmos, ectropion and exposure keratitis were appropriately managed by instillation of lubricating drops during daytime and ointment at night. Lid taping was advised at night time. Patients were taught to frequently think and blink and physiotherapy was advised for facial palsy of recent onset. Antibiotic drops and ointments were advised as required in cases presenting with chronic conjunctivitis and diffuse lid swelling. In cases with uveitis, a combination of antibiotic and steroid drops was used along with cycloplegic drugs. Patients were also warned about consequences of un-monitored long term topical steroid use. Patients with cataract were advised to undergo cataract surgery. Importance of regular ocular examination even after release from treatment (RFT) was stressed in all patients with and without ocular findings.

RESULTS

Table 1: Distribution of patients according to age

Age in years	Males	Females	Total	Percentage
10-20	08	7	15	20%
21-30	10	9	19	25.33%
31-40	08	3	11	14.66%
41-50	11	2	13	17.33%
51-60	06	4	10	13.33%
>60	05	2	07	9.33%
Total	48	27	75	100%

Fifty three patients (70.66%) in our study belonged to the age range 21 to 60 years

Table 2: Distribution of patients with ocular involvement according totype of leprosy

Type of Leprosy	Cases with bacilli in conjunctival smear	Total No. of cases	No. of cases with ocular involvement	Percentage
Tuberculoid	1	7	2	5.88%
Borderline Tuberculoid	13	43	18	52.94%
Borderline Borderline	0	1	1	2.94%
Borderline Lepromatous	11	11	5	14.70%
Lepromatous	6	7	7	20.58%
Pure Neuritic	0	6	1	2.94%
Total	31	75	34	100%

Out of total18 patients belonging to borderline lepromatous and lepromatous type (11borderline lepromatous and 7 lepromatous leprosy), 12 patients (66.66%) had ocular manifestations.

Table 3: Distribution of Ocular involvement in Leprosy

Ocular Involvement	No. of cases	Percentage
SupercilliaryMadarosis	21	61.76%
Lid Swelling	15	44.11%
Lid Nodule	01	02.94%
Lagophthalmos	07	20.58%
Ectropion	10	29.41%
Chronic Conjunctivitis	15	44.11%
Corneal Hypoasthesia	10	29.41%
Corneal Opacity	06	17.64%
Anterior Uveitis	06	17.64%
Cataract	12	35.29%
Exposure Keratitis	2	5.88%

More than one ocular lesion was present in many.

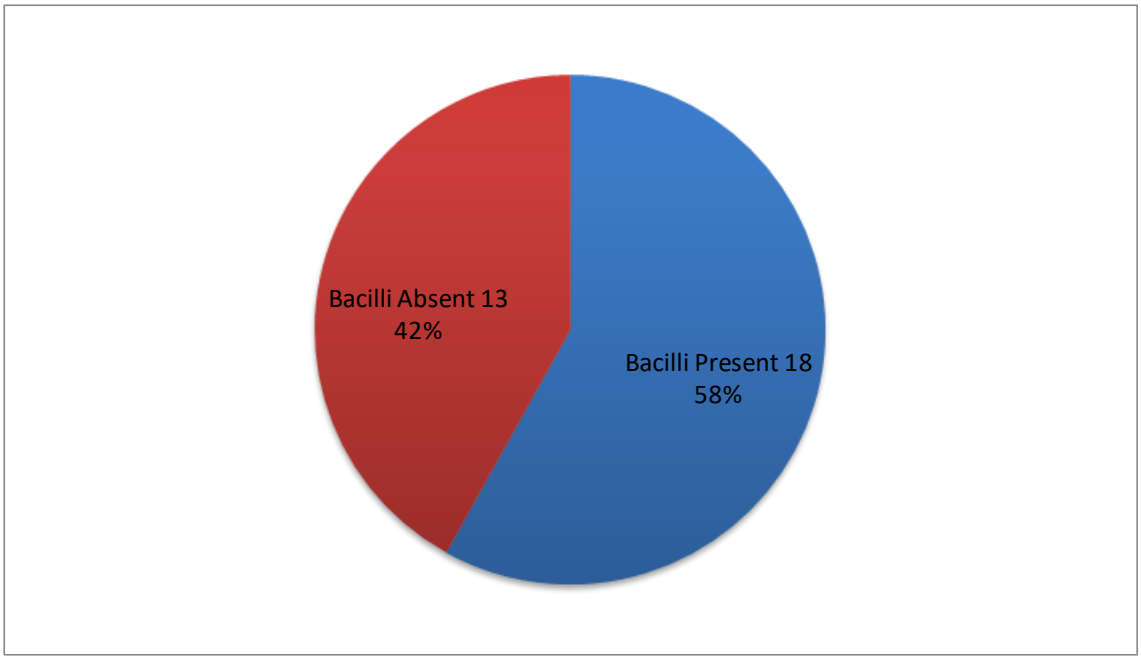

Figure 1: Distribution of patients with presence of Lepra bacilli

Out of the 31 patients with presence of lepra bacilli in the conjunctival smear, ocular lesions were seen in 18 patients (58.06%) while 13 patients (41.93%) were without any ocular lesion.

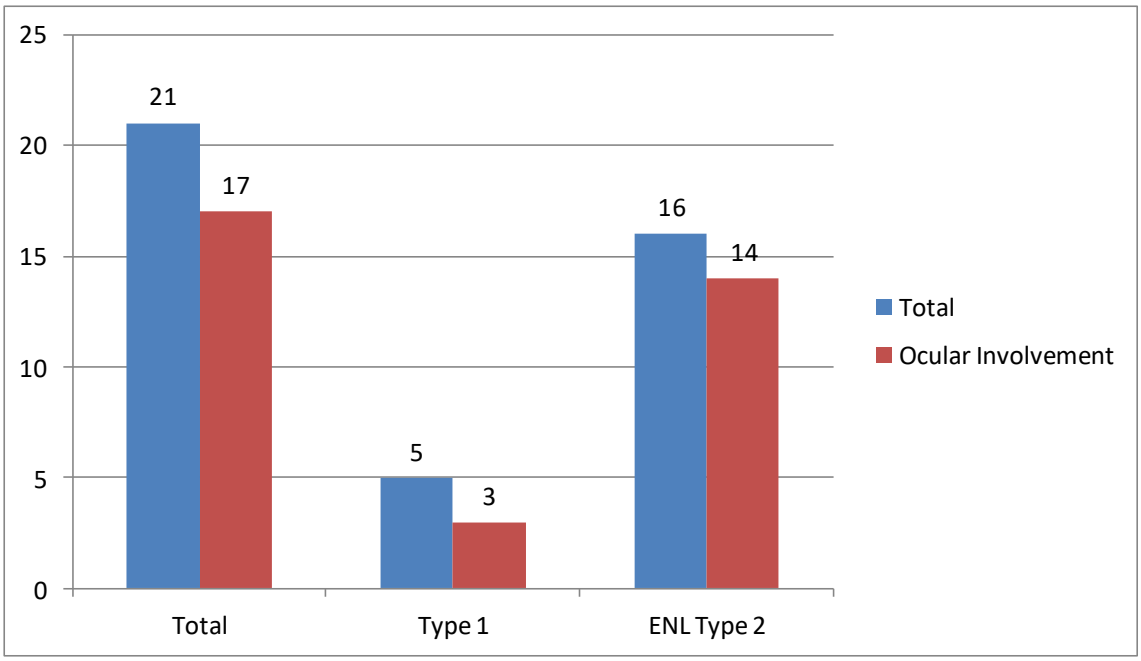

Figure 2: Association of presence of lepra reaction to ocularinvolvement

DISCUSSION

Early diagnosis and management of ocular problems certainly decrease the damage and avert blindness in at least some cases of leprosy. In a person who is already disabled by hands and feet blindness is catastrophic.The prevalence of blindness due to leprosy has been estimated as being 4.7% in India in the over-all leprosy affected population.(3)

Seventy-five patients of leprosy were enrolled for the study. Fifty three patients (70.66%) in our study belonged to the age range 21 to 60 years (Table 1) which is economically productive. With the stigma and disabilities due to the disease this can affect the quality of life. In other studies, cases of leprosy in economically productive age group ranged from 60.41% to 92.13% (4,1) .There were 63.66% (47) male cases. Other studies too state that more males are affected by the disease. Some studies attribute this to the less hesitancy in males to report and also there are more chances of acquiring infection in males.(1,2,4)

Maximum patients 43 (57.33%) had Borderline tuberculoid (BT) as shown in Table 2. Whereas other studies, report more number of lepromatous leprosy patients than tuberculoid type. (3,5)

Ocular involvement was seen in 34 cases (45.33%) in our study. The reporting of prevalence of ocular involvement varies in different studies depending on many factors like inclusion of ocular lesions such as senile cataract in leprosy patients for which leprosy is not the cause, diagnosis of the ocular lesions by non-ophthalmic person etc.(3).

Twenty males (58.82%) had ocular involvement. More male patients with ocular involvement are stated in most available studies. (1, 3, 4, 5)

According to some researchers ocular involvement is more in lepromatous leprosy because of presence of more number of lepra bacilli in eyes of lepromatous leprosy patients compared to tuberculoid type. (3) In our study group too out of 18 patients belonging to borderline lepromatous and lepromatous type (11borderline lepromatous and 7 lepromatous leprosy), 12 patients (66.66%) had ocular manifestations.

Lepra bacilli in the conjunctival smear were seen in 31 patients (41.33%) as shown in Table 2. Ocular lesions were seen in 18 patients (58.06%) with lepra bacilli in conjuctival smear(Figure1).

The presence of lepra bacilli in conjunctival smear could be explained by direct access to conjunctiva through nasolacrimal passages from the nasal mucosa where bacilli are abundant. Though not seen in our study, leproticdacryocystitis secondary to nasal disease is a common complication in leprosy.(6) Campos et al. in 1998 report lepra bacilli in conjunctiva. (7) Orefice et al.demonstrated presence of lepra bacilli in conjunctiva in lepromatous leprosy patients.(8)

Ocular involvement was seen in all seven patients (100%) in which duration of leprosy was more than five years. Samuel C et al.state ocular involvement is directly proportional to the duration of leprosy. (5)Table 3 shows various ocular lesions observed in our study group. Other studies too report similar lesions.(1,3,4,5)

Superciliarymadarosis was seen in 21 cases (61.76%). Supercilliarymadarosis is also most common ocular manifestation in available studies. Though not sight threatening, madarosisis cosmetically disfiguring,depressing and has social stigma.

Lagophthalmos, corneal involvement,uveitis and cataract were potentially sight threatening lesions observed in 23 patients (67.64%). Out of the seven having lagophthalmos, three had corneal hypoesthesia. Lagophthalmos and ectropion

lead to chronic conjunctivitis in our patients.

Corneal hypoesthesia was seen in five, exposure keratitis in four and corneal opacity was seen in six patients. More than one corneal lesion was present in some. Out of six patients of anterior uveitis, three belonged to lepromatous while other three to tuberculoid type. Samuel C et al.have quoted that iritis or anterior uveitis is said to be the common cause for blindness in Hansen's disease. (6)

The twelve cataract patients (35.29%) reported in our study include both cataract due to leprosy as well as age related senile cataract. In addition to being at risk for blindness due to typical age related cataract, leprosy patients are also at risk of complicated cataract due to chronic or acute uveitis.(9)

Amongst the patients having potentially sight threatening lesions, four had visual acuity less than counting fingers at three meters in one eye. But in the other eye the visual acuity was 6/60 or better. These patients were made aware of possible loss of sight in future and were asked to report every month or earlier in case of worsening of ocular problem.

Leprosy rarely affects the fundus.(10) No fundus pathology was observed in the study group.Premanandam M et al. state that patients have the greatest risk for developing eye complications due to lepra reaction. Out of 21 patients with presence of lepra reaction, ocular involvement was seen in 17 patients (80.95%) as is depicted in Figure 2. (3)

In this study, all the patients with ocular manifestations were either being treated or had history of treatment with systemic anti leprosy drugs. Samuel C et al.state that leprosy related ocular pathology progresses in some patients even after they are cured microbiologically. The progressive leprosy related lesions are the result of chronic nerve damage or immunological reaction (5).

Courtright et al. too mention ocular pathology will still occur in treated leprosy patients. Leprosy is widely prevalent in India. Although the disease is present throughout the country, the distribution is uneven. (10)

Based on the reports received from the states/union territories for the year 2013-14, the current leprosy situation in India is as follows:-

A total 1.27 lac new cases were detected during the year 2013-14, which gives annual new case detection rate of 9.98 per lac population.

A total of 0.86 lac cases were on record as on 1st April 2014, giving prevalence rate of 0.68 per 10000 populations.

The detailed information of new leprosy cases detected during 2013-14 indicates the proportions of multibacillary cases was 51.48 per cent, proportion of female cases was 36.91 per cent, child case proportion was 9.49 per cent, which gives the child case rate of 0.95 per lac population), 4.14 per cent patients were with grade- 2 deformity, giving deformity rate of 0.413 population.

33 states/ union had already achieved the level of leprosy elimination i.e. prevalence rate of less than 1 case per 10000 population.

As on 31st March 2014, 459 districts out of 657 annual new case detection rate less than 10 per lac population, 83 districts more than 20per lac population and only 18 districts are with more than 50 per lac population.(11,12)

Leprosy is caused by M. leprae. They are acid-fast and occur in the human host both intracellularly and extracellularly. They occur characteristically in clumps or bundles called globi. They have an affinity for Schwann cells and cells of reticuloendothelial system. They remain dormant in various sites and cause relapse(13-15). A number of related studies have been reported (16-20). Studies on leprosy by Zodpey et. al. (21), Gulhane et. al. (22) and Gupta et. al. (23,24) were reviewed.

The anti-leprosy treatment though has markedly improved the outcome of those affected; ocular involvement can be seen even after completion of anti-leprosy treatment.

CONCLUSION

The anti-leprosy treatment though has markedly improved the outcome of those affected; ocular involvement can be seen even after completion of anti-leprosy treatment. Considering the seriousness, eye complications in leprosy needs special consideration. Moreover many problems can be prevented with early detection and timely and appropriate management. Health education along with careful examination and regular follow up of every leprosy patient for ocular involvement by ophthalmologists and more frequent examination and follow up of those already affected may help in decreasing the leprosy associated blindness.

REFERENCES:

1. Dr. R. Sudha, Dr. N. Suneel, Dr. O. Gopala Krishna, Dr. G.Chandrasekhar. Incidence and Management of Ocular complications/Manifestations in Leprosy Patients Who Are Attending to a Tertiary Care Hospital. Journal 0f Medical Science and Clinical Research. 2015 Jan;3(1):3719-3727.
2. Reddy SC, Raju BD. Ocular involvement in leprosy: a field study of 1004 patients. International Journal of Ophthalmology 2009;2(4):367-372.
3. Premanandam M, Narendranatha Reddy G. A Clinical Study on Ocular Manifestations of Leprosy. Journal Of Medical Science And Clinical Research. 2015 Feb;3(2):4269-4276.
4. Junaid S. Wani M.S., Sabia Rashid M.S, MuzaffarSherwani M.S, A.R. Nasti M.S. Ocular manifestations in leprosy – A clinical study. JK- Practitioner. 2005;12(1):14-17.
5. Samuel C, Sudharanjan C. Ocular Manifestation in Hansen's Disease-A Clinical Study. IJMRHS. 2014Jun;3(4):829-32
6. Smith DS. Leprosy. Leprosy treatment & Management: Medical Care, Surgical Care, MEDSCAPE Consultations. [Internet] 2014Jul. Available From: http://emedicine.medscape.com/article/220455-overview
7. Campos WR, Rodrigues CA, Oréfice F, Monteiro LG. Identification of M.leprae in conjunctiva of leprosy patients using the superior tarsal conjunctiva scrape technique.
8. Indian J Lepr. 1998 Oct-Dec;70(4):397-403
9. Orefice F, Miranda D, Boratto LM. Presence of M. leprae in the conjunctiva, vitreous body and retina of a patient having lepromatous leprosy. Indian J Lepr. 1998Jan-Mar;70(1):97-102
10. Courtright P, Lewallen S, Lee H S. Comparison of the old and new WHO leprosy disability grading scheme for ocular disabilities. Int Ophthalmol 199115265–268.
11. YK, Lee HJ, KimSH.Cataract in leprosy patients: cataract surgical coverage, barriers to acceptance of surgery, and outcome of surgery in a population based study in Korea. Br JOphthalmol. 2001;85:643-647.
12. Shivayogi R. Kusagur, Mamatha S. Kusagur, Gururaj K.J. A clinical study of ocular manifestations in leprosy. Journal of Evolution of Medical and Dental Sciences. 2013Sep;2(36):6816-6823.
13. Rastogi N, Legrand E, Sola C. The mycobacteria: an introduction to nomenclature and pathogenesis. Rev Sci Tech. 2001 Apr;20(1):21-54.
14. Park K. Epidemiology of communicable diseases. Park's Textbook of preventive and Social Medicine. 23rd ed. Jabalapur :BanarsidasBhanotPublishers;2015.

314-330 .

15. Bhat RB, Prakash C. Leprosy: An Overview of Pathophysiology. Interdisciplinary Perspectives on InfectiousDiseases. 2012; Article ID 181089 Availablefrom:http://dx.doi.org/10.1155/2012/181089.
16. Lohiya, Sohan, and Rajiv Pardasani. "Ocular Manifestations of Cytomegalovirus (CMV) - A Case Report." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 10, no. 5 (February 1, 2021): 319–22. https://doi.org/10.14260/jemds/2021/71.
17. Baisakhiya, Shikha. "Opportunistic Ocular Infections in AIDS." ASIAN PACIFIC JOURNAL OF TROPICAL MEDICINE 1, no. 2 (June 2008): 65–70.
18. Patil, Aishwarya Bhalchandra, Adarsh Lata Singh, Bhushan Madke, Anugandha Ghatge, Sugat Jawade, and Sudhir Singh. "Comparison of Efficacy of Slit Skin Smear and Fite Faraco Stain on Histopathology Specimens in Cases of Leprosy." JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH 14, no. 3 (March 2020). https://doi.org/10.7860/JCDR/2020/43019.13543.
19. Singh, Adarsh Lata, S. J. Vagha, Amit Agrawal, S. R. Joharapurkar, and Brij Raj Singh. "Current Scenario of Leprosy at Tertiary Care Level Hospital of Rural Central India." INDIAN JOURNAL OF DERMATOLOGY VENEREOLOGY & LEPROLOGY 75, no. 5 (October 2009): 520–22. https://doi.org/10.4103/0378-6323.55409.
20. Van Veen, Natasja H. J., Ton A. R. Schreuders, Willem J. Theuvenet, Amit Agrawal, and Jan Hendrik Richardus.
25. "Decompressive Surgery for Treating Nerve Damage in Leprosy." COCHRANE DATABASE OF SYSTEMATIC REVIEWS, no. 1 (2009). https://doi.org/10.1002/14651858.CD006983.pub2.
21. Zodpey, SP, BS Bansod, SN Shrikhande, BR Maldhure, and SW Kulkarni. "Protective Effect of Bacillus Calmette Guerin (BCG) against Leprosy: A Population-Based Case-Control Study in Nagpur, India." LEPROSY REVIEW 70, no. 3 (September 1999): 287–94.
22. Gulhane, Sweety Haribhau, Keshao Madhukar Hiwale, Arvind Shridhar Bhake, Sunita Vagha, and Samarth Shukla. "Study of Morphological Patterns of Leprosy in a Rural Setup." JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS 9, no. 9 (March 2, 2020): 603–7. https://doi.org/10.14260/jemds/2020/134.
23. Gupta, Bharti, Shekhar Gupta, Minal Chaudhary, A. Thirumal Raj, Kamran Habib Awan, and Shankargouda Patil. "Hematological Alterations in Lepromatous Leprosy: A Cross-Sectional Observational Study." DM DISEASE-A-MONTH 66, no. 7, SI (July 2020). https://doi.org/10.1016/j.disamonth.2019.100919.
24. Gupta, Bharti, Shekhar Gupta, Minal Chaudhary, A. Thirumal Raj, and Shankargouda Patil. "Oro-Facial Manifestations in Lepromatous Leprosy Patients in Central India: Clinical Findings from a Cross-Sectional Study." CLINICAL ORAL INVESTIGATIONS 24, no. 6 (June 2020): 1981–86. https://doi.org/10.1007/s00784-019-03061-1