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Original Article

Ocular Disability - WHO Grade 2 in persons affected with leprosy

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Leprosy remains to be a leading cause of peripheral neuropathy and disability. In recent years under Leprosy control programme more stress is being laid on disability assessment. This study was aimed to find prevalence of grade of Ocular disability among persons affected with leprosy (PAL) according to WHO disability grading scale and to find Ocular contributors to grade 2 disability in PAL. A cross sectional study was carried out in tertiary care hospital in Lucknow, Uttar Pradesh. About 302 PAL were interviewed and their eyes clinically examined during 2 years. Data was analysed in percentages, x^2 test, Anova. Ocular disability was found in 39.40% persons affected with leprosy (PAL). Of 604 eyes, 13.07% had grade 1 disability and 19.86% had grade 2 disabilities. Bilateral disability was more common than unilateral disability. Ocular disability was more common in PAL with more than one year of leprosy and even higher in those staying in leprasoria (p=0.012). The most common cause of ocular grade 2 disabilities was corneal involvement (14.23% PAL). Cataract was found to be the most common cause of visual disability (although it is not caused by leprosy). Screening for ocular disability should be incorporated as a routine protocol in PAL to reduce the severity of Ocular disability. Early diagnosis and prompt preventive measure is essential to reduce the burden of visual impairment and blindness in PAL thus bringing down the load of grade 2 disability due to leprosy in the society which in itself is an indicator of leprosy control.

Keywords: Ocular Leprosy, Ocular disability, PAL, Leprasoria

Introduction

"A world without leprosy" remains the vision of WHO. Leprosy, among all communicable diseases is still a leading cause of peripheral neuropathy and disability in the world (Albert et al 2011). India alone contributes to two thirds of the Leprosy patients. The WHOs Enhanced Global Strategy for further reducing the disease burden due to leprosy 2011-2015 has suggested innovative approaches for case finding in order to reduce the delay in diagnosis and occurence of grade 2 disabilities among new cases.

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The Strategy focuses on "rate of new cases with grade 2 disability" among new cases per 100000 population as a key indicator to monitor progress of leprosy programmes in addition to current list of indicators (WHO 2009). In literature there is available only limited data specifically about grade 2 ocular disability in persons affected with leprosy separately. To meet the challenge of leprosy problem the thrust now is shifting from simply providing antileprosy treatment to dealing with the consequences of leprosy. Ocular disability grade 2 is one of the key factor which may be present and require attention even after leprosy has been treated and the person declared RFT (released from treatment).

In wake of above background we conducted a cross-sectional study to assess the magnitude of problem of ocular disabilities in persons affected with leprosy (PAL) in current scenario of treatment modalities and strategies for fight against leprosy and its consequences. The study was approved by ethical committee of ELMC & Hospital and adhered to the tenets of declaration of Helsinki.

Material and Methods

Persons affected with leprosy from leprosy villages/Leprasoria (selected on the basis of accessibility) and those on treatment in the out patient department of skin and ophthalmology were invited to participate in the study, irrespective of their current anti leprosy treatment status. For inclusion in study from each person affected with leprosy, after explaining the purpose and conduct of the study, consent was obtained.

For each consenting individual data on age, sex and duration of leprosy (since diagnosis was made) were recorded. The type of leprosy (multibacillary/paucibacillary) was determined from the person's medical notes or by inference from subjects description of their treatment regimen.

Persons affected with leprosy (PAL) included in study were grouped as: Group I : Newer cases (<1year duration of Leprosy) on domiciliary treatment; Group II : >1 year of Leprosy and on domiciliary treatment or RFT; Group III : >1 year of Leprosy and in Leprasoria for treatment or RFT.

Visual Acuity (VA) was assessed using the Snellens chart or illiterate E chart. PAL were examined by an ophthalmologist (LS) using a pen torch and direct ophthalmoscope. For the purpose of data analysis the eyes were graded according to disability grading system for leprosy given by WHO in 1998 (Brandsma and van Brakel 2003).

Grade 0 : No eye problem due to leprosy, no evidence of visual loss.

Grade I : Eye problem due to leprosy but vision not severly affected (vision 6/60 or better). Grade II : Severe visual impairment (vision worse than 6/60) and all visible deformities of the eye such as lagophthalmos, iritis and corneal opacity.

Data Analysis

The ocular morbidity noted was further analysed in various analytical combinations with cause contributing to grade 2 disability (G2D). Data were entered in Excel work sheet and analysed using statistical software package (SPSS for windows, version 16.0, SPSS Chicago, IL, USA). Univariate categorical analysis was performed using the two paired t test, chi square test, Mann – whitney U test or Fisher's exact test as appropriate. The level of statistical significance was set at 0.05 (two sided) in all statistical tests.

Results

In all 302 persons affected with leprosy met the inclusion criteria of study and were evaluated. Of these 76 (25.17%) were females and 226 (74.83%) males, of age ranging from 7 years to 80 years

Table 1 : Groups of PAL

TOTAL	GROUP I	GROUP II	GROUP III
PAL	< 1yr of leprosy + on domicillary t/t	> 1 yr of leprosy + on domicillary t/t	> 1 yr of leprosy + in leprasoria/village
n=302	131	79	92

Table 2 : Laterality of ocular disability

Ocular disability grading	Laterality (n=119 PAL) Unilateral (%)	Bilateral (%)
Grade 1	10 (3.31)	28 (9.27)
Grade 2	29 (9.60)	52 (17.21)
Total	39	80

p=0.304 X^2=1.06

Table 3 : Overall Ocular disability Vs PAL Groups

PAL eyes	Grade 1	Grade 2
Group I (n=262)	6 (2.29)	17(6.48)
Group II (n=158)	18 (11.39)	45(28.48)
Group III (n= 184)	55(29.89)	58(31.52)

P=0.012 X^2=8.84

with mean age 36.5 yrs. (95% CI 34.6-38.3). 222 (73.51%) PAL suffered with Multibacillary and 80 (26.49%) with Paucibacillary leprosy. Of 302 PAL, in 131 (43.38%) PAL duration of Leprosy was less than 1 year (Group I), in 79 (26.16%) more than 1 year and they were on domiciliary treatment/ RFT (Group II) and 92 (30.46%) had leprosy for >1 years and were staying in Leprasoria for treatment / RFT (Group III). (Table 1)

Ocular Disability

Amongst 302 PAL included in the study in all 119 (39.40%) had ocular disability which was unilateral in 39 (12.91%) cases and bilateral in 80 (26.49%) cases. Considering the worse eye as criteria for further grading the ocular disability in these groups, there was no statistically significant difference in level of disability between two groups - as in unilateral group grade 1 disability (G1D) was in 25.64% and in bilateral group it was 35% while grade 2 disability (G2D) was 74.36% and 65% in unilateral and bilateral group respectively (Table 2).

For statistical consideration and grading the ocular disability on WHO grading scale (as related to leprosy disability) each eye was considered as a separate unit. Of 604 eyes of 302 PAL, 199 (32.93%) eyes had ocular disability, G1D in 79 (13.07%) and G2D in 120 (19.86%) eyes. ocular G1D was 6 (2.29%) in group I, 18 (11.39%) in group II and 55 (29.89%) in group III whereas ocular G2D was 17 (6.48%) in group I, 45 (28.48%) in group II and 58 (31.52%) in group III PAL eyes (Table 3).

Condition contributing to the ocular G2D

Ocular disability grade 2 as suggested by WHO includes not only visual impairment but also other visible ocular involvements as well viz. Lagophthalmos, Corneal involvement and Uveal involvement. Analysis of data on ocular involvement contributing to G2D alone showed that the proportion of visual impairment was significantly high i.e. 67.5% (81 eyes) though apparently it may appear much less when considered in PAL as a group13.4% (302 PAL).

The prevalence rate within leprosy G2D PAL is directly proportional to duration of leprosy and still more so in PAL staying in leprasoria/ resettlement village as compared to those on domicillary treatment. i.e. 8 (9.88%) in group I, 23 (28.39%) in group II and 50 (61.73%) in group III cases.

Table 4 : Contributors to Ocular G2D disability

Ocular morbidity in G2D (n=120 eyes)	Group I (n=17)	Group II (n=45)	Group III (n= 58)
Vn < 6/60 (81)	8 (47.05)	23(51.11)	50(86.20)
Lagophthalmos (29)	3(17.64)	12(26.66)	14(24.13)
Corneal ulcer and scarring (43)	5(29.41)	18(40.00)	20(34.48)
Ac or chr uveitis/Sclerouveitis (36)	2(11.76)	13(28.88)	21(36.20)
Cataract (51)	6(35.29)	21 (46.66)	24(41.37)

The prevalence of other associated ocular disabilities contributing to G2D (120 eyes) according to WHO standards included lagophthalmos 24.17% (29), keratitis and corneal opacity 35.83% (43) and uveal involvement in 9.17% (11) eyes. (Table 4)

Senile cataract though not caused by Leprosy per say, is one of the major cause of visual disability (BCVA less than 6/60). Complicated cataract was found in only 5% (6) eyes.

Discussion

Amongst PAL participating in the present study males and multibacillary cases outnumbered females and paucibacillary cases respectively. The overall prevalence of ocular disability, irrespective of grade of disability, in present study was 32.93%. Literature shows widely varied ocular involvement/ morbidity prevalence rate in various studies. In a study from Nigeria (Nwosu and Nwosu 2005) it was 44.7% and in Ethiopia (Ramos and Reyes 2011) it was reported only 13.5%. Laterality of ocular disability in PAL is of significance that it is more commonly bilateral (26.49%); than being unilateral (12.91%); and in the former group the ocular disability in majority cases (65%) was G2D. Farooq et al in Pakistan reported 49.3% disability in right eye and 50.6% disability in left eye (Soomro and Pathan 2009).

For purpose of data collection and analysis WHO disability scale considers eyes rather than individuals. In our study, in 262 eyes of PAL with leprosy less than one year, G1D was 2.29% and G2D was 6.48%. Over all ocular disability (G1D and G2D) was higher in PAL with more than one year of leprosy and much higher in those staying in the leprasoria/resettlement village (p=0.012) this may be because some PAL with disability preferring to stay there.

In present study, severe visual impairment and blindness also contributing to ocular disability grade 2 (BCVA < 6/60) in 604 eyes, was seen in 13.41% eyes. In study from Nigeria it was 17.9% (Mpyet and Solomon 2005). In worldwide population of blind PAL; of all causes of blindness 0.5-1% are directly related to leprosy and another 1-2% due to co-morbidity with general eye diseases (Hogeweg and Keunen 2005). The LOSOL study on eye disease in MB leprosy patients at baseline shows an age adjusted prevalence of blindness of 2.8% (VA <0.1) (Courtright and Daniel 2002).

In our study, most common cause for G2D due to leprosy was corneal involvement-ulceration and scarring, 14.23% PAL (35.83% eyes of 120 eyes with G2D) suffered with corneal scarring. 36% prevalence of corneal scarring was reported in inmates of a leprasoria in Cameroon (Mvogo and Bella-Hiag 2001). In a study from China 50% of blindness was due to corneal diseases (Hogeweg and Keunen 2005) and in Yemen 35.9% PAL had corneal opacity which was also the main cause of

blindness (Samanta 2007). PAL 11.92% (30% eyes of 120 eyes with G2D) had uveal involvement. In the past iritis and sclerouveitis with secondary glaucoma were important causes of blindness in leprosy which has decreased in present scenario of use of clofazimine in MDT, chronic uveitis is however still seen in patients with long history of MB leprosy (Hogeweg and Keunen 2005).

In present study lagophthalmos was seen in 9.6% PAL (24.17% of eyes of 120 eyes with G2D). The LOSOL study reported overall prevalence of lagophthalmos in 3.3% of newly diagnosed MB affected PAL (Courtright and Daniel 2002) and in other study from a leprasoria in Cameroon 10% PAL had lagophthalmos (Mvogo and Bella-Hiag 2001). In available literature there is only limited data regarding the prevalence of ocular disability and no statistics regarding the proportion of individual contributing cause of grade 2 disability in eyes. Of all the ocular disabilities, visual loss is the worst adding further to the burden on society and prevalence of G2D in PAL. Although cataract is not caused by leprosy (except complicated cataract), this was found to be the most common cause for ocular G2D i.e. 16.88% PAL (42.50% of eyes with G2D) as also reported in a study from Nigeria where 52% of total patients with visual impairment and 46% of total patients with blindness had cataract (Mpyet and Solomon 2005) and Hogeweg and Keunen in (2005) also opined cataract to be the most common cause of blindness in PAL.

It is emphasized that cataract, being completely curable surgically, can be taken care of with utmost certainty with latest aseptic and micro-surgical techniques with good outcome irrespective of deformities and bacteriological status. This shall grossly reduce prevalence of ocular G2D and help formulate better strategies for combating burden of leprosy as disease (Salem 2012).

Since a higher percentage of individual contributing causes of ocular grade 2 disability was found with longer duration of leprosy and all treated cases add to the pool of PAL, persons staying at home need to be followed regularly up visavis those at leprasoria can have regular checkup at their centre itself for ocular involvements. Arrangement for eye examination, refraction, cataract surgery and lagophthalmos surgery be made available to the PAL easily approachable as possible. The limitation of the study was the small sample size and the registration delay of PAL could not be ascertained.

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