

Oral Health in a Cohort of Leprosy Affected Persons (LAP): An Observational Study

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Abstract: Leprosy is a chronic disease caused by a bacillus *Mycobacterium Leprae*. Leprosy currently affects a quarter of a million people throughout the world with a majority of them reporting from India.¹ Very few studies have been carried out in the world to know the oral health status and treatment needs in people affected with leprosy. Hence the present study was planned: 1) to assess oral health status in a cohort of leprosy affected persons (LAPs), 2) to assess their knowledge, attitude and oral hygiene practices. A cross-sectional study was carried out in a tertiary care Municipal Hospital for leprosy. Demographic details were collected and a detailed oral examination was performed. Oral hygiene practices and clinical oral examination using natural light, oral hygiene aids, oral habits, decayed missing filled teeth (DMFT) index, the use and need for prosthesis, periodontal disease and the presence of mucous membrane oral lesions was recorded. A total of 66 leprosy patients were recruited. Nearly 46% of the study participants never visited a dentist. One-fifth of the study participants were not using any toothpastes or oral rinsing liquids for cleaning their teeth. Nearly 58% of the study participants were using tobacco products. Average decayed tooth was one and missing tooth was observed as 11. Similarly, 68% required at least one tooth to be extracted, 22.7% required scaling, 4.5% required restoration of teeth, 1.5% needed root canal treatment and 62.1% required a prosthodontic treatment. More than three-fourths of the study participants had poor oral hygiene. Poor awareness and poor oral hygiene was observed in the present study on leprosy patients.

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I. Introduction

Leprosy, caused by *Mycobacterium leprae*, is one of the leading infectious diseases resulting in severe disabilities. Disabilities are usually observed in eyes, hands and feet and have been graded from zero to two by the World Health Organization (WHO).² The highest prevalence of leprosy in the world is observed in the South-East Asian region (around 150,000). Global controlling measures has reduced the caseload of leprosy by 90%.³ WHO has implemented the steps for eliminating leprosy by 2020.⁴ Although the prevalence of leprosy has drastically reduced to 0.65/10,000 population in India, more than two-thirds of the new cases of leprosy are from this country.⁵

Leprosy varies from milder tuberculoid to more severe lepromatous types. Orofacial manifestations are a part of lepromatous leprosy.⁶ Missing teeth is a common finding in leprosy patients due to involvement of the bones in the pathophysiology of the disease.⁷ In fact, around two-thirds of the leprosy patients there could be some form of oral involvement.⁸ However, examination of oral health is often neglected. Hence, we carried out the present study to assess the oral health in patients with leprosy in a tertiary care Hospital.

II. Material And Methods

Study design and ethics:

The present study was a cross-sectional study carried out between September and December 2017 in a tertiary care Municipal Hospital for leprosy, Mumbai. We obtained approval from Institutional Ethics Committee and the Ethics Committee granted waiver for informed consent.

Study procedure:

Leprosy affected patients treated in the above Hospital were recruited for this study. Demographic details were collected and a detailed oral examination was performed for each participant. Oral hygiene practices and clinical oral examination using natural light, oral hygiene aids, oral habits, decayed missing filled teeth (DMFT) index, the use and need for prosthesis, periodontal disease and the presence of mucous membrane oral lesions was recorded.

Statistical analysis:

Descriptive statistics was used to represent the central tendency of all the variables. As no specific hypothesis was made, we did not attempt in calculating a sample size.

III. Result

General demographic features:

Sixty-six participants (34 males and 32 females) were enrolled in the study with mean (SD) age (in years) of 66 (11.5) (Table 1). Mean (SD) duration of leprosy amongst the study participants was 39.3 (16.4) years and the mean (SD) duration of admission in the hospital was 19.5 (18.2) years. There was no external phenotypic manifestations of the disease observed in 6/66 (9%) participants while the remaining had involvement of at least one part of their body. Of these 60 participants, 9 (15%) had involvement of their hands, 34 (56.7%) had involvement of other parts of their body in addition to their hands and 17 (18.3%) did not have any involvement of their hands.

Dental demographic features:

A large majority (30/66, 45.5%) of the study participants never visited dentists, 17/66 (25.8%) had their dental visits more than 10 years ago, 8/66 (12.1%) had visited a dentist between six and 10 years ago, nine (13.6%) between one and five years ago and two (3%) visited less than a year. Those who visited dentists did so either in the hospital (33/66, 50%) or in the health-care set-up (2/66, 3%). Similarly, nearly half (30/66, 45.5%) had never undergone any dental related treatment while 34/66 (51.5%) had undergone tooth extraction and two (3%) were taking medicines for their dental complaints. Forty-three out of the total 66 (65.2%) were using toothbrush, 13/66 (19.7%) were using their fingers, 9/66 (13.6%) were using oral rinse liquid and 1/66 (1.5%) used datun for brushing their teeth. Similarly, 43/66 (65.2%) used toothpaste, 10/66 (15.2%) used mishri, 9/66 (13.6%) used a rinsing agent, 3/66 (4.5%) used tooth powder and 1/66 (1.5%) used datun as tooth brushing agents. More-than two-thirds of the study participants (42/66, 63.6%) were brushing once a day while 31.8% (21/66) twice daily and 3/66 (4.5%) more than two times per day. Nearly half (38/66, 57.6%) of the study participants had the habit of using tobacco in one or more of the following ways: Gutka, Pan, Supari or oral intake of tobacco as such.

Dental examination findings:

Mean (SD) of decayed tooth was one (2.4) amongst the study participants. Similarly, mean (SD) of missing tooth was observed as 11 (10.8) and mean (SD) of root pieces was 3.6 (6.5). Only six participants (9%) had undergone prosthetic replacement of their teeth of which two participants had nine units of prosthesis placed while one each had one, two, three and four units. Fifty-seven of the total 66 participants (86.4%) had prompt while 7/66 (10.6%) needed dental treatment on urgent basis and two (3%) did not require any dentistry related treatment. 45/66 (68.2%) required at least one tooth to be extracted while 15/66 (22.7%) required scaling, 3/66 (4.5%) required restoration of teeth, 1/66 (1.5%) needed root canal treatment, prosthodontic treatment was required in 41/66 (62.1%) while none of the study participants required an orthodontic treatment. Oral examination revealed a general attrition in 2/66 (3%) and one (1.5%) each had poor oral hygiene, ulcer on the right upper lip, glossitis with burning mouth syndrome and oral sub-mucosal fibrosis. Rest of the study participants did not have any significant findings. Only one study participant had good oral hygiene while 50/66 (75.8%) had poor and the remaining (15/66, 22.7%) had fair hygiene.

Table no 1. Age and Sex wise distribution of LAP (Leprosy Affected Persons)

Age	Number	Percentage
>50 years	09	13.6
51-60 years	16	24.2
61-70 years	20	30
71-80 years	19	28.8
<80 years	02	3
Sex		
Male	34	51.6
Female	32	48.4

Table no 2. Key findings from the studies that assessed oral health in patients with leprosy.

Study Id; Year and country of publication	Key findings
Nunez-Marti 2004 ⁷ ; Spain	<ul style="list-style-type: none"> 76 leprosy patients assessed compared to matched healthy controls. The mean plaque index in leprosy was 2.35 ± 0.7, with a probing depth of 2.96 ± 0.8, and an average attachment loss of 4.18 ± 1.3.
Feng 2014 ⁹ ; China	<ul style="list-style-type: none"> 472/613 (77%) leprosy patients never visited dentists. <ul style="list-style-type: none"> 172/613 (28.1%) never brushed their teeth. 55.6% patients required dental filling; 32.7% required pulp care and restoration; 71.1% required extraction. Almost all required periodontal and 84.5% needed normative prosthetic treatment.
De Almada 2017 ¹⁰ ; Brazil	<ul style="list-style-type: none"> 303 patients with leprosy assessed. <ul style="list-style-type: none"> Self-reported loss of upper teeth was 45.5%. <ul style="list-style-type: none"> 54.5% had active caries. Most (97.7%) cases reported having been to the dentist at least once in their life. 87 (28.7%) reported not having been to the dentist for three years or longer.
Souza 2009 ¹¹ ; Brazil	<ul style="list-style-type: none"> 99 leprosy patients assessed. <ul style="list-style-type: none"> Decayed teeth were present in 73%. Mean number of lost teeth was 8.8. 60.3% did not have filled their teeth. <ul style="list-style-type: none"> 92% had gingival bleeding. Average DMFT index was 14.4. 9/63 patients had oral lesions.
Guo 2017 ¹² ; China	<ul style="list-style-type: none"> 613 leprosy patients assessed with 607 controls <ul style="list-style-type: none"> The average DMFT score was 10.39 and twice than that of controls. <ul style="list-style-type: none"> 5.58% patients never brushed their teeth. the average individual in the leprosy group had An average of 4.43 unfilled carious teeth, 5.94 teeth were extracted because of dental caries and only 0.02 teeth were restored after caries removal.
Chaluvraj 2003 ¹³ ; India	<ul style="list-style-type: none"> 211 patients were interviewed and examined using WHO Oral Health Assessment Form <ul style="list-style-type: none"> 39.3% had calculus, 34.9% had shallow pockets and 6.8% had deep pockets. Mean DMFT score was 5.7 and the mean number of decayed teeth, missing and filled teeth is 2.16, 3.53 and 0.009 respectively. Majority (45%) required extraction and 41.7% required dentures.
Jacob Raja 2016 ¹⁴ ; India	<ul style="list-style-type: none"> 62 leprosy patients <ul style="list-style-type: none"> Gingival recession (54.8%) was a predominant finding <ul style="list-style-type: none"> Tooth loss was observed in around 70% Nearly two-thirds of the participants had impaired mobility and attrition Chronic pulpitis was observed in 34.7% and dental caries in 26%.

IV. Discussion

We carried out the present study to assess oral health in a cohort of 66 leprosy affected patients. Surprisingly, nearly 46% of the study participants never visited a dentist. Nearly one-fifth of the study participants were not using any toothpastes or oral rinsing liquids for cleaning their teeth. Almost two-thirds of the study participants were using tobacco products. Average decayed tooth was one and missing tooth was observed as 11. Similarly, 68% required at least one tooth to be extracted, 22.7% required scaling, 4.5% required restoration of teeth, 1.5% needed root canal treatment and 62.1% required a prosthodontic treatment. More than three-fourths of the study participants had poor oral hygiene.

Leprosy is a multi-system disease with several orofacial manifestations. Several studies have previously assessed the status of oral health and oral hygiene in leprosy affected patients. A summary of key studies with their findings is provided in (Table 2)⁹⁻¹⁴. The results of the present study are similar to those findings. Poor oral hygiene is very commonly observed amongst leprosy patients. Due to altered immune system activity in leprosy, in the oral cavity lesions are observed in the following sites: hard and soft palate, in the uvula, on the underside of the tongue, and on the lips and gums.¹⁵ Gingival recession was more pronounced in patients with leprosy followed by tooth loss, mobility, attrition, and chronic pulpitis. India ranks the top in the list of leprosy patients followed by Brazil. The results of this study are imperative to initiate steps in creating and spreading awareness for screening and adhering to frequent dental visits. Due to cranial nerve involvement, leprosy patients are unable to perceive symptoms of oral disease.¹⁶ Even the treating physicians of patients with leprosy should be aware of this fact and should appropriately refer or consult oral health professionals.¹⁷ Additionally, leprosy patients with attrition of hand may find it difficult to use toothbrush and toothpaste for maintaining oral hygiene and the future studies should explore this aspect in leprosy patients.

V. Conclusion

The present study is limited in not following up with the study participants and interview was not conducted to assess the reasons for not visiting dentists. To conclude, poor awareness and oral hygiene was observed in our cohort of leprosy patients.

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