

Research Article

# A Contemporary Cross-Sectional Study on Oral Manifestations of Leprosy

Gopalakrishnan Thangavel<sup>1</sup>, S Sabarinathan<sup>2</sup>, Senthilkumar Annamalai<sup>3</sup>, M Rajasekar<sup>4</sup>, Yaseer Arafat<sup>5</sup>, M R C Rajeswari<sup>6</sup>, S Bharathesh<sup>7</sup>, P Arunkumar<sup>8</sup>

<sup>1</sup>Reader, Department of Oral Pathology and Microbiology, Sri Ramakrishna Dental College and Hospital, Coimbatore, Tamilnadu, India.

<sup>2</sup>Assistant Professor, Government Medical College and hospital, Kallakurichi, Tamilnadu, India.

<sup>3</sup>Senior assistant Professor, Department of Oral and Maxillofacial Surgery, Tamilnadu Government Dental College and Hospital, Chennai, Tamilnadu, India.

<sup>4</sup>Private practitioner and Consultant Maxillofacial Surgeon, Uthangarai, Krishnagiri District, Tamilnadu, India.

<sup>5</sup>Assistant professor and Consultant, Department of Oral and Maxillofacial Surgery, ACS Medical College and Hospital, Chennai, Tamilnadu, India.

<sup>6</sup>Professor & Head, Department of Oral Pathology and Microbiology, Priyadarshini Dental College and Hospital, Thiruvallur, Chennai, Tamilnadu, India.

<sup>7,8</sup>Senior lecturer, Department of Prosthodontics and Crown & Bridge, Priyadarshini Dental College and Hospital, Thiruvallur, Chennai, Tamilnadu, India.

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## I N F O

### Corresponding Author:

Gopalakrishnan Thangavel, Department of oral Pathology and Microbiology, Sri Ramakrishna Dental College and Hospital, Coimbatore, Tamilnadu, India.

### E-mail Id:

[gopalan.jkm@gmail.com](mailto:gopalan.jkm@gmail.com)

### Orcid Id:

<https://orcid.org/0000-0003-0086-5525>

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## A B S T R A C T

**Introduction:** Leprosy, originating from the Greek word "lepi," meaning scales similar to those on a fish, is also commonly known as Hansen's disease (HD). It was first recorded in ancient Indian texts from the 6th century BC. This disease, caused by the bacteria *M. leprae* and *M. lepromatosis*, has persisted over time. The oral mucosa, including areas such as the tongue, lips, soft palate, and uvula, is often affected.

**Aim:** This contemporary cross-sectional study aims to analyse the oral manifestations of patients with leprosy.

**Materials and Method:** The study was conducted at the Department of Dermatology, Rajiv Gandhi Government Medical College Chennai. Personal and medical histories, along with the findings from oral examinations and investigations, were documented using a proforma specifically designed for this study.

**Results:** The study included 100 leprosy patients, comprising 66 males and 34 females, aged between 10 and 83 years. Among them, 20% had chronic generalised periodontitis, 16% exhibited papillae atrophy, and 15% experienced loss of taste sensation. Additionally, 12% reported aphthous ulcers and candidiasis each. Moreover, 13% presented with depigmentation, 7% had a fissured tongue, and 5% showed symptoms of oral submucous fibrosis (OSMF).

**Conclusion:** Oral lesions associated with leprosy are nonspecific and often overlooked or misdiagnosed by clinicians. The role of dental professionals, especially oral medicine specialists, is crucial in the early diagnosis of these oral lesions. Thus, a comprehensive understanding of this chronic infection is essential for providing the highest standard of healthcare.

**Keywords:** Oral Findings of Leprosy, Oral Leprosy, Leprosy and Teeth

## Introduction

Leprosy, derived from the Greek word “lepi” meaning scales akin to those on a fish, commonly known as Hansen’s disease (HD), was initially documented in ancient Indian texts dating back to the 6th century BC. It is characterised as a chronic infectious disease caused by *Mycobacterium leprae*, predominantly affecting the skin, peripheral nervous system, upper respiratory tract, eyes, and testes. This condition persists over time and is instigated by the bacteria *M. leprae* and *Mycobacterium lepromatosis*. For a long time, there has been a widespread misunderstanding regarding the nature of leprosy. It was previously perceived as a mutilating and highly contagious ailment with no remedy, triggering public panic and resulting in the mass isolation of leprosy patients into secluded colonies. While leprosy was once prevalent globally, its incidence has now significantly diminished, primarily concentrated in the following five countries where it remains a progressively debilitating condition: India, Brazil, Mozambique, Nepal, and Madagascar. Most patients endure some form of lasting consequences. In addition to neural and cutaneous symptoms, leprosy can also impact mucosal surfaces and lead to internal disability even after treatment. The oral mucosa is frequently affected, including areas such as the tongue, lips, soft palate, and uvula. Several studies have demonstrated the presence of orofacial manifestations across all variants (indeterminate, tuberculoid, borderline, and lepromatous) of leprosy.<sup>1</sup> Aside from neural and cutaneous symptoms, leprosy can also affect mucosal surfaces and result in internal disability even after treatment. The oral mucosa, encompassing areas such as the tongue, lips, soft palate, and uvula, is commonly affected. Multiple studies have shown the presence of orofacial manifestations across all variants (indeterminate, tuberculoid, borderline, and lepromatous) of leprosy. Manifestations on the tongue may involve the loss of papillae and the development of longitudinal fissures.<sup>2</sup> Fibrosis, scarring, and the loss of the uvula are also frequently observed. Additionally, patients may present with chronic inflammation of the gingiva and periodontium.<sup>3</sup>

## Materials and Method

The present study was conducted at the Department of Dermatology, Rajiv Gandhi Government Medical College and Hospital, Chennai from January 2023 to July 2023. A total of 100 subjects diagnosed with leprosy were randomly selected from the outpatient departments of Rajiv Gandhi Government Medical College and Hospital, Chennai. Ethical approval for the study was obtained from the institutional ethics committee and written consent was obtained from each participant. Statistical analysis using the chi-square test was employed to assess the disease and explore the correlation between age and gender.

The personal and medical histories, along with the findings of oral examinations and investigations, were documented using a pro forma specifically tailored for this study. All patients diagnosed with leprosy, regardless of age or sex, who met the WHO criteria and were receiving multidrug therapy (MDT), were included in the study, irrespective of their clinical form. Patients who had completed their treatment with antileprotic drugs or had a history of any other systemic condition were excluded from the study.

## Results

The study included 100 leprosy patients, consisting of 66 males and 34 females, with ages ranging from 10 to 83 years and a mean age of  $37.4 \pm 13.3$  years. Within the study population, there were 3 males and 1 female under 20 years old, 10 males and 9 females aged 21 to 30 years, 22 males and 8 females aged 31 to 40 years, 23 males and 11 females aged 41 to 50 years, 2 males and 2 females aged 51 to 60 years, 2 males and 2 females aged 61 to 70 years, 1 male and no female aged 71 to 80 years, and 2 males and 1 female aged 80 years and above (Table 1). A chi-square test was conducted for statistical analysis to assess the disease and determine the correlation between age and gender, with a p value of  $< 0.05$  considered significant.

Oral manifestations were observed in all 100 leprosy patients. Among them, 20% had chronic generalised periodontitis (males-13, females-7), 16% exhibited atrophy of papillae (males-11, females-5), and loss of taste sensation was seen in 15% of patients (males-10, females-5). Additionally, 12% reported aphthous ulcers and candidiasis each, (males-8, females-4). While 13% presented depigmentation (males-9, females-4), 7% showed fissured tongue (males-4, females-3) and symptoms of oral sub mucous fibrosis (OSMF) were seen in 5% of patients (males-3, females-2) (Figure 1).

Among the total of 66 males, all had oral manifestations. Specifically, 13 (19.6%) were diagnosed with chronic generalised periodontitis, followed by 11 (16.6%) cases of atrophy of papillae, while loss of taste sensation was noted in 10 (15.2%). 8 (12.1%) cases of aphthous ulcers and candidiasis were recorded. Additionally, 9 (13.6%) cases of depigmentation, 4 (6%) cases of fissured tongue and 3 (4.5%) cases of OSMF were observed.

Out of the total of 34 females, all exhibited oral manifestations. Among them, 7 (20%) had chronic generalised periodontitis, followed by 5 (14.7%) cases, each of atrophy of papillae and loss of taste, while 4 (11.7%) cases of candidiasis, depigmentation and aphthous ulcers were noted. Additionally, 3 (8.8%) cases of fissured tongue and 2 (5.8%) cases of OSMF were observed.

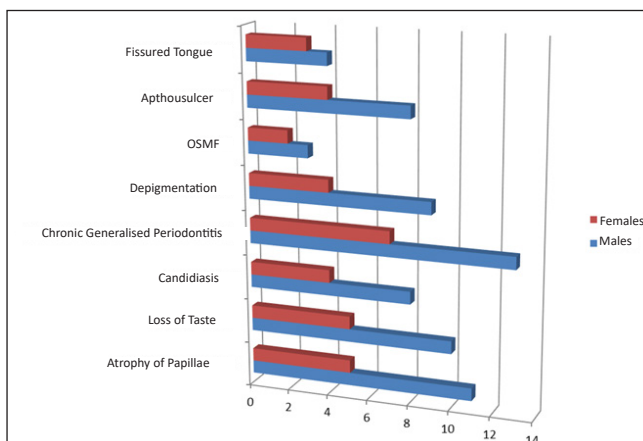
In the study population, out of 100 leprosy patients, 80% had normal salivary flow, 16% experienced decreased salivary flow, and 4% had increased salivary flow (Table 2). However, these results were not statistically significant (p value  $> 0.05$ ).

**Table 1. Distribution of Age Group in the Study Population**

Age Group (Years)	No. of Males	No. of Females
10–20	3	1
21–30	10	9
31–40	22	8
41–50	23	11
51–60	2	2
61–70	2	2
71–80	1	0
Above 80	2	1

**Table 2. Salivary Flow among Leprosy Patients**

Salivary Flow	No. of Patients
Normal	80
Increased	4
Decreased	16

**Figure 1. Oral Manifestations of Leprosy**

Note: One patient may exhibit multiple types of lesions

## Discussion

Oral health is closely linked to overall health. Screening and diagnosis are crucial for understanding diseases and achieving an accurate diagnosis. Family medicine practitioners and healthcare professionals form the backbone of medical services. Family medicine specialists at the primary care level play a vital role in serving the general population, particularly those unable to afford private care. Patients with illnesses often come from lower economic backgrounds and seek treatment at government hospitals. Evaluating the knowledge and confidence of family medicine specialists in diagnosing and managing patients with illnesses is crucial due to the increasing prevalence of diseases. However, the level of knowledge and confidence among these primary care providers is currently unknown.<sup>4</sup> Understanding the oral manifestations present in leprosy will similarly assist

health professionals in comprehending the disease better and delivering primary and effective care. In the present study, we have endeavoured to assess oral manifestations in leprosy patients. The sequence of pathological changes follows the pattern described by Pinkerton in 1932 in the nasal and oral mucous membranes: congestion, infiltration, nodule formation, ulceration, atrophy, and fibrosis.<sup>5</sup>

Significant medical and dental complications may arise from the involvement of the oral and nasal mucous membranes, as well as the facial bones, in leprosy.<sup>6</sup> The upper airway serves as the primary point of entry for the bacillus and a pathway for bacillary elimination in leprosy.<sup>7–10</sup>

In our study population, 80% of patients exhibited poor oral hygiene and periodontal status, while 18% had fair oral hygiene and periodontal status. Only 2% demonstrated good oral hygiene and periodontal status. These findings align with previous research conducted by Costa et al. in 2003, who emphasised the importance of maintaining good oral hygiene to prevent further spread of infection and reduce the incidence of oral lesions.<sup>7</sup>

Out of a total of 100 leprosy patients, it was observed that all exhibited oral manifestations. These oral lesions in leprosy tend to develop insidiously and are generally asymptomatic, often secondary to nasal changes. Specifically, 20% had chronic generalised periodontitis, while 16% showed atrophy of papillae and 15% showed loss of taste sensation. Additionally, 12% complained of aphthous ulcers and candidiasis, 13% presented depigmentation, 7% showed fissured tongue and 5% exhibited symptoms of OSMF. These findings are consistent with a previous study conducted by Costa et al. in 2003.<sup>7</sup>

All 66 males had oral manifestations. Among them, 13 (19.6%) were diagnosed with chronic generalised periodontitis, 11 (16.6%) with atrophy of papillae, and 10 (15.2%) with loss of taste sensation. 8 (12.1%) cases of aphthous ulcers and candidiasis were recorded. Additionally, 9 (13.6%) cases of depigmentation, 4 (6%) cases of fissured tongue, and 3 (4.5%) cases of OSMF were observed.

Out of the total of 34 females, all exhibited oral manifestations. Chronic generalised periodontitis was seen in 7 (20%) participants, followed by 5 (14.7%) cases each of atrophy of papillae and loss of taste. Candidiasis, depigmentation and aphthous ulcers were observed in 4 (11.7%) cases. Additionally, 3 (8.8%) cases of fissured tongue and 2 (5.8%) cases of OSMF were observed. Similar results were reported in previous studies found in the literature<sup>11,12</sup>

Given the significant complications that can arise from the involvement of the oral and nasal mucosa, as well as the facial bones, in leprosy, patients should undergo careful examination. Additionally, they should be informed about the importance of improving their oral hygiene.<sup>13–17</sup>

Building on the ideas of other authors, it is believed that oral mucosal lesions serve as sources of infection in leprosy patients. These individuals expel significant numbers of bacilli when they spit, sneeze, cough, or speak. Once released into the environment, these bacilli could remain viable for up to nine days or even longer.

However, oral features in leprosy were still observed in the hard palate and premaxilla, including cases of bilateral seventh nerve palsy.<sup>18–20</sup>

By implementing appropriate and effective antimicrobial therapy, patients can lead productive lives within the community, and deformities and other visible manifestations can largely be prevented. Three major strategic components of leprosy control encompass early detection of the disease, providing adequate treatment, and offering comprehensive care to prevent disabilities and facilitate rehabilitation.<sup>21</sup>

## Conclusion

Oral leprosy lesions present nonspecifically and are frequently overlooked or misdiagnosed by clinicians. The role of dental professionals, particularly oral medicine specialists, is crucial in the early diagnosis of these oral lesions. Therefore, a comprehensive understanding of this chronic infection is essential to deliver the highest standard of healthcare.

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**Conflict of Interest:** None

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