Leprosy is a chronic granulomatous disease caused by Mycobacterium leprae, which mainly affects the skin, peripheral nerves, upper respiratory tract, and the eyes. Left untreated, leprosy can be progressive, causing permanent damage to the skin, nerves, limbs, and eyes.\[^{1,2}\] Leprosy, which was supposed to be eradicated in India 8 years ago, still records the highest number of fresh cases globally. Leprosy was declared eliminated on January 1, 2006, with the prevalence of 0.98/10,000 populations in India.\[^{2}\] Multidrug therapy being the main weapon against leprosy and has considerably reduced the incidence of leprosy in India significantly from 8.9/10,000 in 2000 to 1.1/10,000 in 2010. Yet, 1.34 lakh new leprosy cases were reported in India during the year 2009–2010. According to WHO, 65% of the fresh cases globally reported are from India. However, the prevalence of the disease has decreased considerably after the introduction of multidrug therapy.\[^{1,2}\] The disease was first described clinically and microscopically by Armauer Hansen in 1874. Leprotic patients suffered from severe social stigma and were isolated from their families, communities, and even health professionals known since ancient times as “the death before death.”\[^{6}\]

Periodontitis is a chronic inflammatory reaction produced by Gram-negative anaerobic bacteria predominantly resulting in the loss of alveolar bone and periodontal ligament. Periodontal disease, the lepromatous form of leprosy, is relatively common and is characterized by frequent gingival bleeding, papillary hypertrophy of the gums, tooth loss, and area of hypoesthesia at the border of alveolar mucosa. Leprosy patients are affected with deformities of hand such as claw hands, anesthesia, stiff joints, thumb paralysis, severe absorption, contractures, cracks, diagnosis and the disease spreads by oronasal mucosa.\[^{4,5}\] The disease was first described clinically and microscopically by Armauer Hansen in 1874. Leprotic patients suffered from severe social stigma and were isolated from their families, communities, and even health professionals known since ancient times as “the death before death.”\[^{6}\]

**ABSTRACT**

**Aim:** After the introduction of the multidrug therapy, the incidence of leprosy is decreasing every year. However, periodontal complaints are commonly seen in these patients due to compromised immunity and impaired oral hygiene. The aim of the present study is to assess the oral and periodontal status of the leprosy patients in Dindigul district. **Materials and Methods:** The study was conducted on 62 patients treated in a leprosy center at Dindigul district. Among these, 22 (35.5%) were female patients and 40 were male patients (64.5%). Age ranges between 40 and 70 with the mean age being 52. Facial changes, periodontal status, dental caries, attrition, tooth loss, plaque index (Silness and Loe), and calculus component of oral hygiene index-simplified were assessed. **Results:** Majority of the patients presented with loss of eyebrows and eyelashes, saddle nose, ocular involvement, and leonine facies. Gingival recession (54.8%) was a predominant finding followed by tooth loss (69.5%), mobility (60.8%), attrition (56%), chronic pulpitis (34.7%), and dental caries (26%). Most of the patients had severe periodontitis. **Conclusions:** Compromised immunity and altered autonomy pave way for many dental complaints such as periodontitis and deposits in tooth with poor oral hygiene. Awareness about the oral health problems and reinforcement of oral hygiene should be insisted to the leprosy patients to prevent further morbidity.

**KEY WORDS:** Dental caries, leprosy, multidrug therapy, periodontitis, plaque
and wounds which further impair the maintenance of oral hygiene. There are only a very few studies to assess the oral and periodontal status of leprosy patients. The goal of this study was to evaluate the oral and periodontal findings in treated leprosy patients.

Materials and Methods

The study was conducted on 26 patients treated in a leprosy center at Dindigul district. Of these, 8 (30%) were female patients and 18 were male patients (70%). Age ranges between 40 and 70 with the mean age being 52. Subjects diagnosed as leprotic (tuberculoid, borderline, and lepromatous) and under multidrug resistance therapy were included in the study. The study was done at various times in the subjects admitted to the leprosy center for the complaint of trophic ulcer. The purpose of the study was explained to the patients, and the informed consent was procured from them. Relative information collected includes patient’s sex, age, familial history, type of disease, and facial complications of leprosy along with oral findings.

The patients were examined under natural light in the leprosy center. Periodontal complaints were examined with mouth mirror and periodontal probe. Albandar et al.’s criteria[7] were utilized to categorize the severity of periodontitis. According to his criteria, the periodontal probing depth was evaluated in millimeters, in all teeth in four dental areas (mesial, distal, buccal, and lingual) which considers periodontal disease extension and severity as follows: (1) Advanced periodontitis – two or more teeth (30% or more of the examined teeth) finding ≥5 mm probing depth; or four or more teeth (60% or examined teeth) finding ≥4 mm probing depth (2) moderate periodontitis – one or more teeth with ≥5 mm probing depth; or two or more teeth (30% or more of the teeth examined) finding ≥4 mm probing depth. (3) Mild periodontitis – one or more teeth with ≥3 mm probing depth. (4) Normal (no periodontitis) – six or more teeth which have not fulfilled any of the above criteria. Dental caries was diagnosed using mouth mirror and explorer. Other dental complaints such as attrition of teeth, tooth loss, and deposits on tooth also considered and taken into account. To assess the extent of plaque, Silness and Loe index[8] was used and to categorize calculus deposits simplified oral hygiene index by Green and Vermillion were used.[9]

Results

Results are calculated as counts and percentages. Among the 62 subjects examined in that center, 62.9% were of tuberculosis type and 37.1% were lepromatous type. Table 1 shows the facial changes and the frequency distribution. The oral manifestations seen in those subjects were periodontal complaints (67.7%), attrition of teeth (54.8%), gingivitis (54.8%), and dental caries and chronic pulpitis (74.2%). Fissured tongue, oral macules, and angular cheilitis were seen in a few patients. Subjects were divided into two groups for tabulating the results [Tables 2-4].

- Leprotic patients with no systemic disease
- Leprotic patients with systemic disease

Discussion

The surpassing oral complaint seen in these subjects was attrition and periodontitis. The affording factors to periodontitis are high plaque and calculus scores which can be attributed to their poor oral habits and affected autonomy. Leprotic periodontitis was most commonly reported in leprotic patients, with more prevalence of periodontitis in lepromatous leprosy patients than tuberculoid type.[10]

Poor oral hygiene in this population was found to be attributed by the high-grade hand disorder. Moreover, there was a high degree of correlation between immune responses against periodontopathic bacteria in leprosy patients. Pocket depth and tooth loss were also observed more in patients with leprosy. Serum IgG against Porphyromonas gingivalis was found to be lesser in patients with leprosy.[10] The most common intraoral sites affected by leprosy include the hard and soft palate, in the uvula, on the underside of the tongue, and on the lips and gums.[11] Gingival recession was more pronounced in patients with leprosy followed by tooth loss, mobility, attrition, and chronic pulps.

Majority of the patients was found to have chronic periodontitis. Poor oral health and periodontal status were also reported in these patients in the study done by Núñez-Martí et al. in 2004. In the leprosy patients, a large proportion of maxillary incisors and canines were missing. The mean plaque index (Silness and Loe), probing depth, and attachment loss in leprosy patients were greater than in controls. The present study also validated Núñez-Martí’s findings in the maxillary alveolar region. About 46.15% of the subjects presented with maxillary alveolar bone loss. According to the WHO, the most common oral pathologies are dental cavities and periodontal diseases. In the present study, the periodontal counterpart outweighed the caries counterpart. The most common reason reported for tooth loss in the edentulous persons was due to mobility. This can be due to poor oral habits and compromised immunity. Leprotic patients acquire the disease at a young age and after diagnosis of the disease they take a course of antibiotics as a part of multidrug therapy which are effective against Gram-positive bacteria which causes dental caries. However, further research needs to be carried to perceive this issue that if the huge load of antibiotic coverage prevents them from high caries count.[11-15]

Conclusions

The conspicuous point of this study within its own limitations is that the compromised immunity and altered autonomy
Table 2: Comparison of oral manifestations between leprotic patients with and without systemic disease

| Describing criteria                                                                 | Attrition | Dental caries | Gingival Recession | Mobility | Tooth loss due to periodontitis |
|-----------------------------------------------------------------------------------|-----------|---------------|--------------------|----------|-------------------------------|
| Leprosy patients without other systemic disease (n=22), %                         | 22 (n=22) | 100 (n=22)    | 81.1 (n=18)        | 50 (n=11) | 77.3 (n=17)                   |
| Leprosy patients with other systemic disease (diabetes mellitus, hypertension) (n=40), % | 100 (n=3) | 52.2 (n=24)   | 40 (n=16)          | 17.5 (n=7) | 50 (n=20)                     |

Table 3: Comparison of plaque and calculus between leprotic patients with and without systemic disease

| Deposits                                                                 | Plaque index | Calculus index - simplified |
|------------------------------------------------------------------------|--------------|----------------------------|
|                                                                       | Mild         | Moderate                   |
| Leprosy patients without other systemic disease (n=22), %              | 31.8 (n=7)   | 63.6 (n=14)                |
| Leprosy patients with other systemic disease (diabetes mellitus and hypertension) (n=40), % | 10 (n=4)     | 55 (n=22)                  |
|                                                                       | 13.6 (n=3)   | 4.5 (n=1)                  |
|                                                                       | 86.4 (n=19)  | 59.1 (n=13)                |
|                                                                       | 10 (n=4)     | 40.9 (n=9)                 |
|                                                                       | 57.5 (n=23)  | 0 (n=0)                    |
|                                                                       | 8.6 (n=1)    | 30 (n=12)                  |
|                                                                       | 17.5 (n=7)   | 17.5 (n=7)                 |

Table 4: Comparison of periodontitis between leprotic patients with and without systemic disease

| Periodontitis                                                                 | Mild | Moderate | Severe |
|------------------------------------------------------------------------------|-----|---------|--------|
| Leprosy patients without other systemic disease (n=22), %                    | 13.6 (n=3) | 0 (n=0) | 86.4 (n=19) |
| Leprosy patients with other systemic disease (diabetes mellitus and hypertension) (n=40), % | 32.5 (n=13) | 10 (n=4) | 57.5 (n=23) |

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Conflicts of interest

There are no conflicts of interest.

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