



Clinical evaluation of non-carious cervical lesions in lepromatous and tuberculoid leprosy

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General Note



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ABSTRACT

Leprosy is an infectious disease with a significant number of cases found in India. It not only affects the skin, nerves and respiratory system but also has considerable effects on the oral cavity. The main objective of this study was to evaluate the non-carious cervical lesions found in Lepromatous and Tuberculoid leprosy patients. The study included a total of 200 leprosy patients out of which 110 patients showed the presence of non-carious cervical lesions. There were variations in the percentage of the three distinct non-

carious cervical lesions found in the leprosy patients. Early diagnosis and prompt treatment of the lesions may provide a better prognosis of the disease as well as the oral health.

Keywords: Leprosy, tooth abrasion, tooth erosion.

1. INTRODUCTION

Leprosy was first described by Hansen (1873) which is an infectious disease occurs due to microorganism mycobacterium leprae. It was also referred as Hansen's disease. Though the origin of the disease is irresolute; the first case was identified in Brazil (Lastória and Abreu, 2014). It is still a matter of concern globally as 2, 50,000 cases are detected annually (Rodrigues and Lockwood, 2011). India has the greatest number of cases (53 per lakh) detected every year. Currently, India constitutes 73.03% of the total cases and 74.9% of the new cases (Sasaki et al., 2001). As suggested by studies, 19% of the districts in the country show a high prevalence of leprosy (Rao, 2006). Amongst the Vidarbha region, it is more common in Amravati, Buldhana, Chandrapur, Gondia, Gadchiroli, and Wardha (Katkar et al., 2017). Two clinical forms of the disease are acknowledged; the 'Tuberculoid leprosy' and the 'Lepromatous leprosy'. Lepromatous leprosy contains relatively more amount of bacterial load than Tuberculoid leprosy. Also the prevalence of candida is high among the leprosy patients than the healthy individuals indicating a predisposition towards opportunistic infections (Gupta et al., 2019). Hence it is more frequently encountered, constituting about 70% of the cases reported in India. Leprosy predominantly shows cutaneous, ocular, neuronal and respiratory involvement. Oral manifestations are seen in about 60% of the cases of Lepromatous leprosy (Pallagatti et al., 2012). Tuberculoid leprosy comparatively shows less involvement of the oral cavity (Pallagatti et al., 2012). Oral lesions are usually asymptomatic and progress slowly. Signs and symptoms of the disease vary depending on the patient's defense mechanisms (Gupta et al., 2019).

As the oral cavity is a reflection of the systemic health, it is important for the dentists as well as the other professionals to know about the various oral presentations of the disease. Lesions manifest as erythematous excrescences or lumps or ulcers (Thirugnanasambandan et al., 2011). They involve different areas of oral cavity like the tongue, hard palate, soft palate, uvula, lips, gums, and the periodontium; however, hard palate is the most common site of occurrence (Levitch et al., 1994). It may also present with small erythematous papules or ulcerative nodules that are similar to oral squamous cell carcinoma. Uvula appears to be distended. Oral mucosa appears pale as the disease advances. In addition to the soft tissues, the hard tissues (teeth) are also affected leading to dental caries, chronic pulpitis, periodontitis, mobility, and early exfoliation of the teeth (Jacob et al., 2016). In carious cervical lesions are typified by the loss of solid mineralized tissues of the teeth like the enamel, dentin and the cementum. They present commonly as a wedge-shaped area in the cervical region of the teeth or sometimes may appear as dome-shaped or cup-shaped depressions (Levitch et al., 1994). Currently, they are categorized as abrasion, erosion, and abfraction. Abrasion can be defined as the pathologic wearing away of the tooth caused due to improper brushing habits or the use of an abrasive dentifrice. Erosion occurs mainly by the acids consumed through the diet or due to some gastric disorders. Abfraction is identified as a wedge-shaped area with its apex pointing inwards, resulting from the excessive occlusal stresses on the teeth. The mechanism behind the non-carious cervical lesions is not clear as a variety of factors play a role in its onset thus making it multifactorial in origin.

Aim

To check the occurrence of non-carious cervical lesions in Tuberculoid and Lepromatous leprosy

Objectives

Leprosy affects the various systems of the body; however, the oral cavity is significantly involved. Periodontium, soft palate, and hard palate show nodules and ulcerations. Regardless of these lesions, there are disturbances in the teeth which remain unnoticed. The study aims to detect and examine in detail the non-carious cervical lesions occurring on the teeth in Tuberculoid and Lepromatous leprosy patients. Early detection of the lesions can help in the better prognosis of the disease as well as in the prevention of the spread of the disease.

2. MATERIALS AND METHODOLOGY

Sources of data

This was a cross-sectional study that was performed on 200 known leprosy patients which were selected from four leprosy centers around Wardha in the Vidarbha region, Maharashtra that included Anandvan, Amravati, Ashokwan, and Dattapur. The study was done in accordance with Indian Council of Medical Research (Reference number:-2019-02749) and the total duration of the study

was 3 months (July to September). Ethical approval was obtained from the "Institutional committee of Datta Meghe Institute of Medical Sciences, Sawangi (Meghe)". A written consent was obtained from the authorities who looked after the leprosy centers. The aims and methodology of the study were explained to the patients and prior permission was obtained from them before initiating the study. Data such as name, age, sex, clinical form of the disease and the current status of treatment were recorded.

Inclusion Criteria

Patients with any form of clinically diagnosed leprosy
 Patients above 18 years of age
 Patients having the presence of a minimum of 15 teeth

Exclusion Criteria

Patients who have not been examined by any medical professional
 Patients who do not have any medical records
 Edentate and partially dentate patients
 Patients having a presence of fewer than 15 teeth

Method of Examination

All the patients were examined using a mouth mirror and probe under a good illuminating light. The intraoral examination included the examination of labial/ buccal, lingual, occlusal/ incisal, mesial /distal and chiefly the cervical aspect of the teeth for presence of any non-carious cervical lesions chiefly the abrasion, erosion, and abfraction which can be defined as:

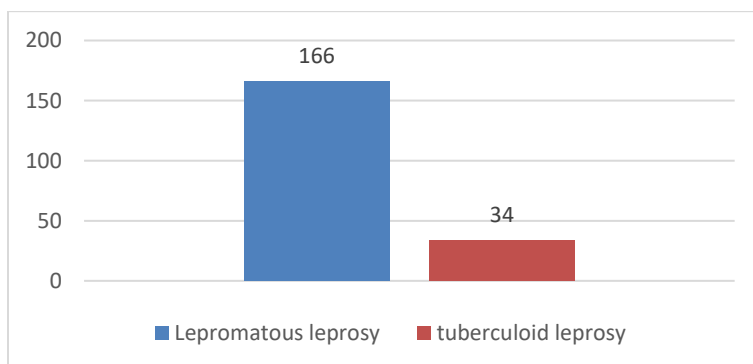
Abrasion: -"It is defined as a pathological process caused by abnormal habits, abnormal functional processes and the use of abrasive substances that results in wearing away of the tooth structure.

Erosion: -"It is defined as loss in tooth structure due to chemical substances.

Abfraction: -"It is a pathological phenomenon in which masticatory forces leads to flexure and ultimate fatigue of the enamel and dentin resulting in loss of tooth substance.

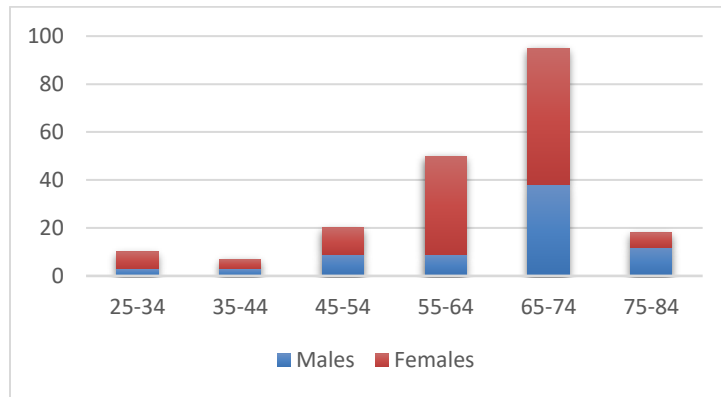
3. OBSERVATIONS AND RESULTS

200 known leprosy patients with a mean age of 62.66 ± 11.95 years were examined at four leprosy centres in the Vidarbha region including Anandvan, Dattapur, Wardha, and Ashokwan. Out of the total 200 patients, 74 were males and 126 were females. A number of Lepromatous leprosy patients were 166 (83%) while only 34 (17%) patients were diagnosed with tuberculoid leprosy (Graph 1, 2). Non carious cervical lesions were observed in 110 patients out of the 200 (that is 55%). 44 out of the 74 male patients presented with non-carious cervical lesions while the figure in female patients was 66 out of the 126. There were variations in the non-carious cervical lesions examined; with abrasion recorded in 85 out of 110 patients (77%), abfraction in 49 out of 110 patients (44%) and erosion in 32 out of 110 patients (29%) (Graph 3, 4). Rarely the lesions were present in combination with each other. Only 9 out of the 110 (8%) patients showed the presence of all the three lesions that is abrasion, erosion, and abfraction. Erosion was found together with abrasion in 10 out of the 110 patients (10%) whereas it was found along with abfraction in only 3 patients (2%). 21 out of the 110 patients (19%) showed both abrasion and abfraction together which was comparatively higher than the others (Graph 5).

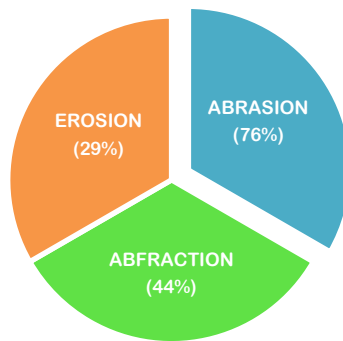


Graph 1 Epidemiology of leprosy

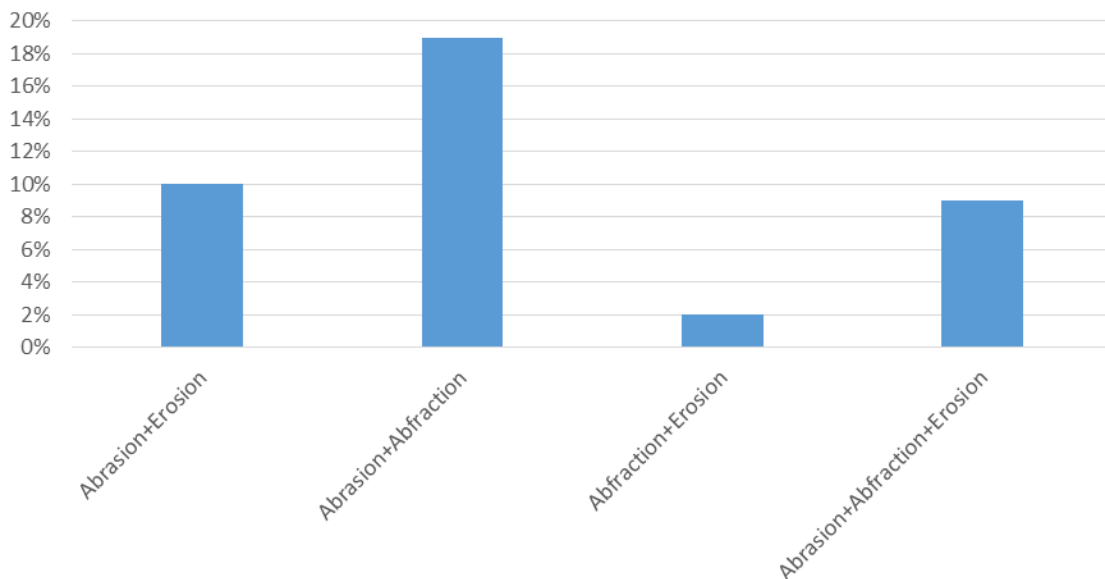
Non carious cervical lesions involved a large number of teeth; however some teeth showed the more frequent occurrence of these lesions. The most common finding was Abrasion found with the maxillary incisors followed by mandibular premolars and mandibular incisors. Maxillary premolars were also affected by abrasion but less commonly than the mandibular incisors and premolars. Abfraction was rather a more common finding in them. Erosion was most commonly noted on the maxillary incisors. Rarely the maxillary and mandibular posterior teeth were found to be affected by these lesions (Fig 1, 2, 3).



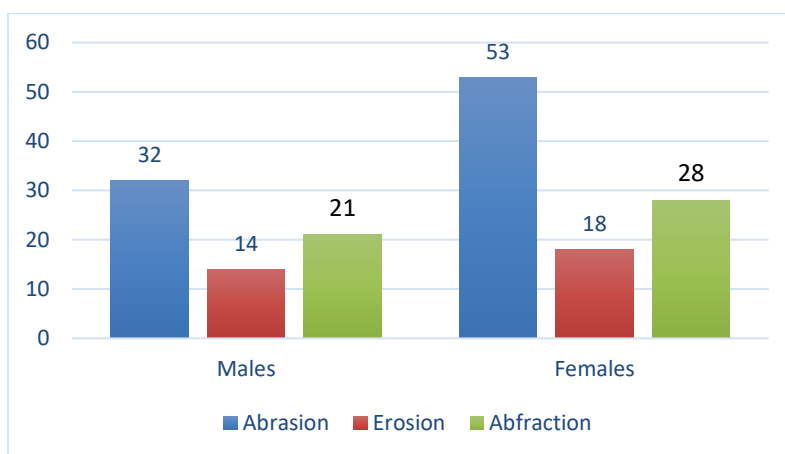
Graph 2 Demographic details



Graph 3 Prevalence of different types of Non carious cervical lesions



Graph 4 Combination of two and more lesion seen in leprosy patients



Graph 5 Percentage of non carious cervical lesions in males and females



Figure 1 Abrasion of maxillary incisors



Figure 2 Abrasion of mandibular canine and premolars



Figure 3 Abfraction of maxillary incisors

4. DISCUSSION

In carious cervical lesions are attributed to the loss of dental hard tissues of idiopathic origin. They are identified by wedge, saucer or cup-shaped defects involving the cervical third of the teeth.

Currently, the Non carious cervical lesions include the following:-

Abrasion

It is defined as the pathological loss of tooth substance as a result of abnormal processes, habits or use of hard and coarse substances. "It appears as a notched, wedge-shaped or 'V' shaped defect involving the facial aspect of the teeth. Etiologic factors for the occurrence of this lesion can be ascribed to improper or vigorous brushing habits, use of dentifrices, and parafunctional habits like bruxism.

Erosion

Due to occurrence of erosion, there is appearance of yellowish, saucer-shaped areas involving the facial as well as the lingual aspect of the teeth. Etiological factors for the occurrence of these lesions can be allocated to the consumption of acidic beverages and citrus fruits. Currently, it is also found that the drugs can also play a role in the development of these lesions.

Abfraction

This causes wearing of enamel and dentin of the teeth which creates wedge- shaped facet with distinct margins on the facial surface of teeth. Excessive occlusal stresses on the teeth and abnormal habits like bruxism and clenching can be considered to be the main etiologic factors resulting in abfraction.

Leprosy shows significant effects on the teeth and oral mucosa. Along with various disturbances that affect the teeth and the surrounding tissues which ultimately result in pulpitis, periodontitis or early exfoliation of the teeth, the non-carious cervical lesions are also found. In our study the prevalence of Non carious cervical lesions was found to be 55%. Of these lesions the most commonly found lesion was abrasion followed by abfraction and erosion. In our study females were found to have more Non carious cervical lesions than males and the commonly involved teeth were premolars followed by incisors. The results of our study are in accordance with the study done by Faye et al. on leprosy patients where the percentage of non-carious cervical lesions was found to be 47% (Faye et al., 2006). However, the author in this study has only included the patients who never used a toothbrush or a dentifrice and frequently consumed acidic beverages and citrus fruits.

According to the Academy of Restorative Dentistry guide, non-carious cervical lesions have multifactorial aetiology and cannot be attributed to a solitary factor (Academy of Operative Dentistry, 2003). As suggested by Nascimento *et al.*, chemico- biological and behavioural factors have a critical role in the origin of non- carious cervical lesions, and depending on the interplay between these factors, such lesions could manifest themselves in clinically in different ways (Nascimento et al., 2016). Since these lesions are multifactorial in origin, appropriate information regarding diet, habits, and oral hygiene practices should be obtained from the leprosy patients. According to literature, it is also found that there is a role of quantity and quality of saliva in the development of these lesions (Raghu and Raghu, 2011). This may be attributed to xerostomia resulting from the drugs involved in the treatment of the disease. Hence the information about the current status of the treatment should also be recorded. As per the multi-drug therapy recommended for the treatment of leprosy, the commonly prescribed drugs to these patients were dapsons, clofazimine, rifampicin, ofloxacin, and minocycline. Along with these antibiotics, anti-inflammatory drugs and steroids were also consumed by the patient for a longer period of time. It has been shown that the Dapsone therapy can cause haematological alterations in the patients (Gupta et al., 2019). Thus the presence of non-carious cervical lesions can be imputed to the side effects caused by these drugs.

5. CONCLUSION

Microbial corrosion and physical forces have a significant contribution in the initiation and advancement of these lesions. Hence a proper and descriptive anamnesis is an important tool to formulate an efficacious treatment plan, based on a multidisciplinary diagnosis, assessing, regulating and whenever possible eliminating the presumable etiological factors. Awareness regarding dental and oral diseases and proper oral hygiene practices should be reinforced in the leprosy patients to prevent further morbidity.

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Informed Consent: Written and oral informed consent was obtained from all individual participants included in the study.

Conflict of Interest: The authors declare that they have no conflict of interest.

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