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AWARENESS ON THE MANAGEMENT OF ORAL MANIFESTATION OF SYPHILIS AMONG DENTAL STUDENTS

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ABSTRACT

Oral manifestations of syphilis include multiple, scattered lesions on the oral mucosa and oropharynx, though the tongue, lips, and jugal mucosa are the most commonly affected sites. Aphthous-like fibrin coated ulcers with grey plaques or ulcers with irregular, whitish edges that are painful at times are also observed. The diffuse character of the inflammatory process in the oropharynx may elicit complaints of sore throat. Oral lesions vary widely in appearance, increasing the complexity of diagnosis if the dental surgeon lacks the required qualifications in stomatology. This study aims at understanding the knowledge among dental students regarding the management of oral manifestation of syphilis. The awareness of syphilis in dentistry is needed because syphilis can be spread by direct contact of mucosal lesions from primary and secondary syphilis or blood and saliva from infected patients. The dentist also plays an important role in the control of syphilis by identifying the signs and symptoms of syphilis, educating the patients, and referral regarding syphilis. A cross-sectional observational (online based) study was conducted in Saveetha Dental College, Chennai,Tamilnadu, India. The study population compromised 100 undergraduate dental students from clinical sites (3rd year, 4th year and interns). A detailed

questionnaire containing questions related to knowledge of participants about causes, clinical presentation, diagnosis and management of syphilis was structured into 8 dichotomous questions. Questionnaire was distributed through an online based survey site called Survey Monkey to participants. The results were obtained in a statistic which is analysed by the website itself. The results were interpreted according to records given by the website. As an overall result, out of 100 participants 83% aware that syphilis is a transmitted disease. 77% of participants claimed that they are aware of the oral manifestation of syphilis. According to the analysis, 70% of participants were aware of the commonly affected sites of syphilis and 59% aware of the fundamental lesion presence with syphilis. However, only 55% have the knowledge about syphilitic gumma (one of the major oral manifestations of syphilis). Those who are confident in diagnosing oral syphilis and aware of management strategies of these lesions are only 48% and 57% respectively. Almost 50% of participants will give advice for a surgical correction in patients with syphilitic lesions. As a conclusion, awareness regarding management of oral manifestation of syphilis has to be improved among dental students and they should be able to plan a proper treatment plan in managing oral manifestation of syphilis in future.

INTRODUCTION

Syphilis is an acute and chronic sexually transmitted disease (STD) caused by *Treponema pallidum.* It is an anaerobic filamentous spirochete bacteria transmitted principally by unprotected sex. This condition produces skin and mucous membrane lesions at its acute phase. During the chronic phase, bone, viscera, cardiovascular, and neurological disease are produced. Varies type of systemic manifestations associated with the latent stages of syphilis results in being the great imitator disease.[1]. The vast majority of cases are transmitted sexually, although it may also be transmitted vertically from an infected woman to her newborn child. Both genital and oral sex are implicated in the transmission of syphilis. As with gonorrhea, humans are the only known natural host for syphilis. The primary site of syphilitic infection is the genitalia, although primary lesions also occur extragenital. Syphilis remains an important infection in contemporary medicine because of the morbidity it causes and its ability to enhance the transmission of human immunodeficiency virus (HIV).[2]

Clinical manifestations of syphilis are divided into stages according to infectious and infectivity of the disease. In the primary, secondary and early latent stages the patient is infectious, and in the late latent and tertiary stages the patient loses infectivity. Primary syphilis occurs after an incubation period of approximately 1–4 weeks, typically in the form of large indurated ulcer (chancre), which is painless and accompanied by regional lymphadenopathy that usually heals spontaneously.[3] In the oral cavity it is identified as a solitary ulcer, which is usually appears on the lip or, rarely on the tongue. Secondary syphilis develops 4–6 weeks after the primary lesion event. Here, this disease will show haematogenous spreading of *T. pallidum*. In this phase, besides the general symptoms and cutaneous signals, patients may develop with oral lesions. The lesion usually appears as aphthous-like fibrin coated ulcerative and infiltrative pattern. Late syphilis appear three years or more after the initial infection and can present as mucocutaneous or visceral disease. Syphilitic gumma is the characteristic lesion,[4] which is caused by endarteritis

obliterans of the vessels, particularly the arterioles, within the mucosa and affects the hard palate, tongue or the tonsils.[5]

While practising dentistry, syphilis can be spread by direct contact of mucosal lesions from primary and secondary syphilis or blood and saliva from infected patients. The dentist also can play an important role in the control of syphilis by identifying the signs and symptoms of syphilis, educating the patient, and referral regarding syphilis. The manifestations and descriptions of syphilis are classically divided into stages of occurrence, with each stage having its own peculiar signs and symptoms related to time and antigen-antibody responses. Syphilis has important implications for dentistry such as oral manifestations and it can be transmitted by direct contact with lesions, blood, and saliva. Because many patients may be asymptomatic, the dentist must approach all patients as though disease transmission were possible and adhere to standard precautions. Dental healthcare workers can be an important component of syphilis control through diagnosis, education, and referral.[6]

Frequently, oral manifestations of this disease diagnosed at the secondary stage as multiple painless aphthous-like ulcers or irregular shaped with whitish edges distributed on the oral mucosa and oropharynx, especially on the tongue, lips, and jugal mucosa. Varies appearance of lesions are seen widely, thus increasing the diagnostic complexity when the dental practitioner is not properly qualified to detect stomatological conditions. Oral manifestations of syphilis are commonly diagnosed mistakenly as other common oral condition.[7]

Moreover, during consultation in dental clinics a thorough clinical history and examination are most important to diagnose syphilis. In addition, serological and microbiological assays should be taken for confirmation of syphilis after suspecting a patient clinically for syphilis. Standard laboratory assays help in diagnosing syphilis at any stage including treponemal and nontreponemal serum tests. The venereal disease research laboratory (VDRL) test and the fluorescent treponemal antibody absorption (FTA-ABS) test will also be carried out for syphilis patients. These tests are to determine the stages of syphilis. According to WHO, biopsy is only required when lesions do not subside completely.[8]

In 1943, first management of syphilis was based on penicillin. Since then, penicillin G benzathine and penicillin G procaine became the drug of choice to treat this disease. Patients with hypersensitivity to penicillin, an oral administration of doxycycline will be prescribed for 14 days or tetracycline for 14 days which has a similar efficacy. These drugs are effective to treat primary,[9]latent secondary and early secondary stages of syphilis. Azithromycin is also an effective drug given to manage syphilis in penicillin-hypersensitive patients for two to three weeks. However, the specialized literature warns that resistance to azithromycin has emerged quickly.[10]

Therefore, this study will help in creating awareness regarding the knowledge, diagnosis, and management of syphilis among dental students. Hereafter, more number of budding dentists may be able to diagnose syphilis from oral manifestation and be aware of the management of this disease. Previously our department has published extensive research on various aspects of prosthetic dentistry [11–21], this vast research experience has inspired us to research about the awareness of management of oral manifestation of syphilis among dental students.

MATERIAL AND METHODS

A convenient sample size of 100 consecutive dental students (3rd year, 4th year and interns) who are currently pursuing in Saveetha Dental College, Chennai participated in the study. A cross-sectional observational online based study was conducted. Questionnaire was constructed on the Survey Monkey website with dichotomous responses (YES/NO). The questionnaire consists of 8 questions with the following criteria as shown in Table 1.

Table 1:shows the criteria of questionnaire questions

Included criteria of dichotomous questionnaire
• Causes of syphilis • Oral manifestation of syphilis • Diagnosing syphilis • Management of syphilis

A link containing these questionnaires was shared with all the participants and required them to answer the questions. All the responses were analyzed and recorded.

RESULTS AND DISCUSSION

A total of 100 participants who responded to the questionnaire were undergraduate students who already entered the clinic and were dealing with outpatients. They consist of 50 of interns, 25 of 4th year and 25 of 3rd year students.

When they were asked about the transmission of syphilis, 83 of them claimed that they knew about it. Whereas the remaining 17 participants are not aware of the transmission method of syphilis.

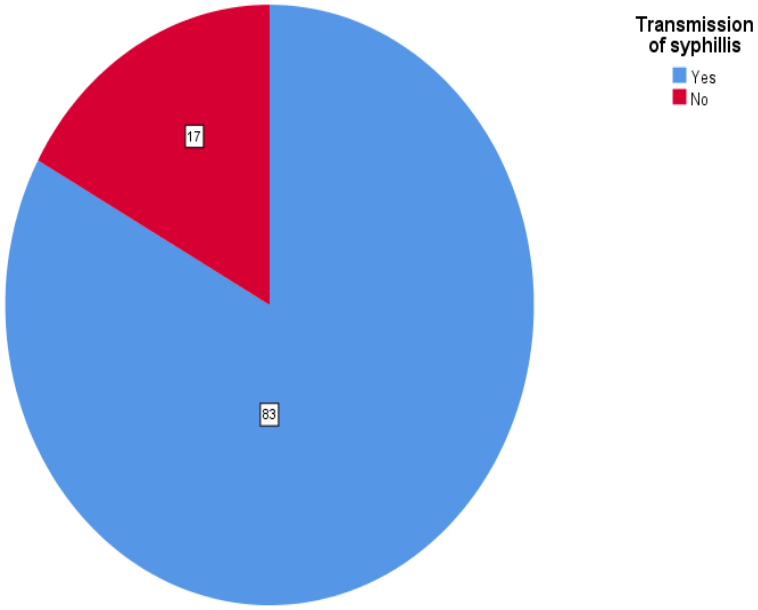

Figure 1: Transmission of syphilis.. The pie chart shows the awareness of students towards the transmission of syphilis among 100 students. 83 students answered Yes(blue) while 17 students answered No (Red).

As dental students, 77 participants are aware of the oral manifestations of syphilis. The other 23 participants have no clue about the oral manifestation of syphilis.

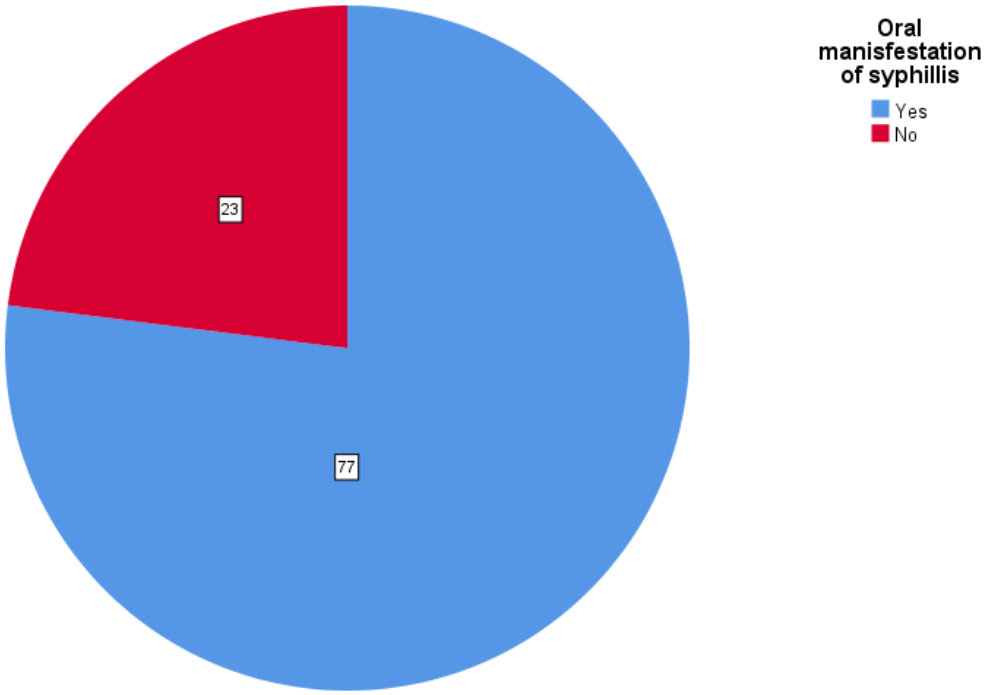

Figure 2: Oral manifestation of syphilis.. The pie chart shows the awareness of students towards the oral manifestation of syphilis among 100 students. 77 students answered Yes(blue) while 23 students answered No (Red).

70 participants said yes for the question asked regarding common anatomical sites affected in syphilis.

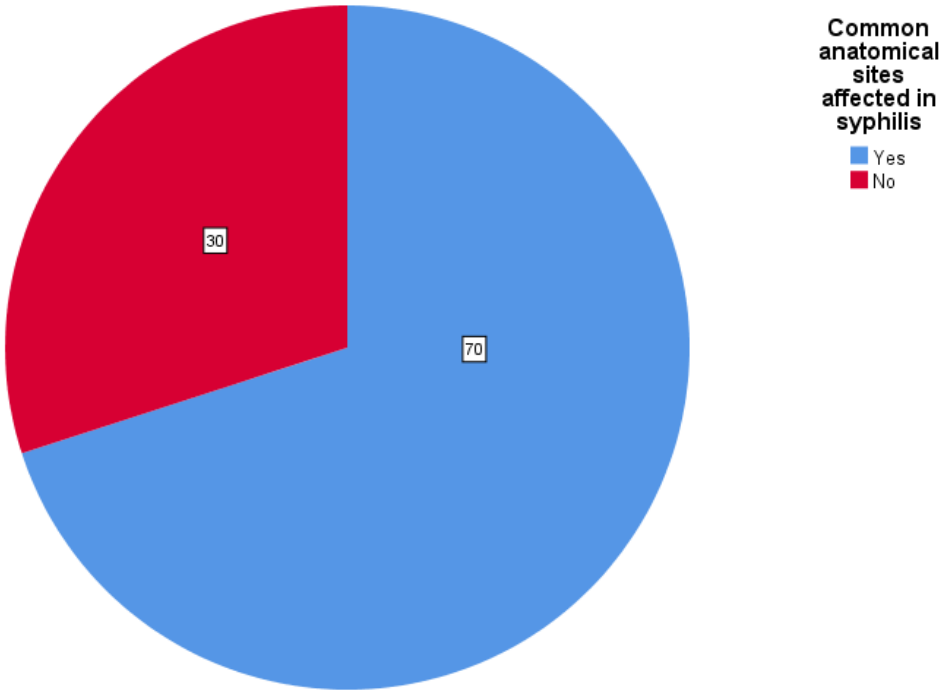

Figure 3: Common anatomical sites affected by syphilis.. The pie chart shows the awareness of students towards the common anatomical sites affected by syphilis among 100 students. 70 students answered Yes(blue) while 30 students answered No (Red).

The fundamental lesions that present with syphilis are aware by 59 participants only, whereas other 41 participants are not aware of it.

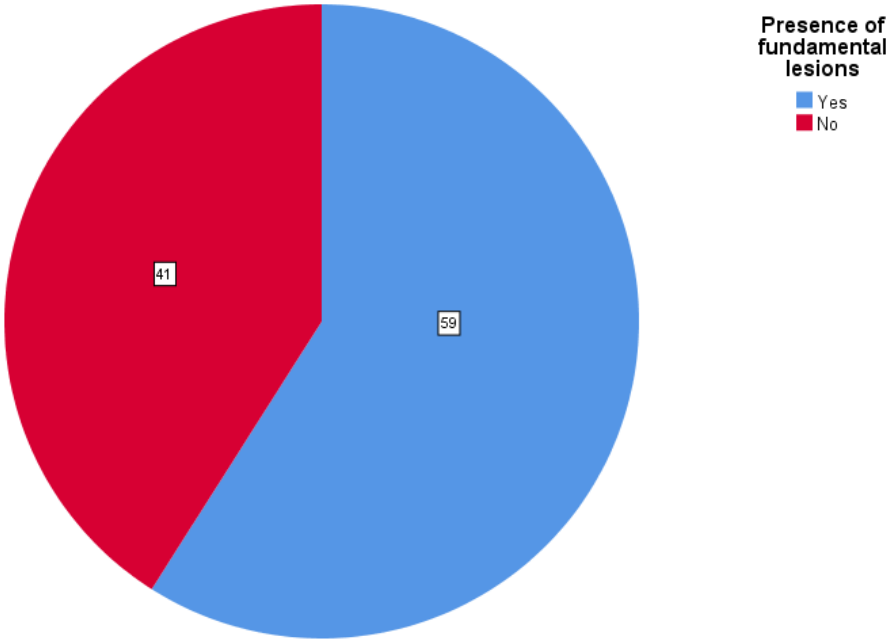

Figure 4: Presence of fundamental lesions due to syphilis.. The pie chart shows the awareness of students towards the presence of fundamental lesions due to syphilis among 100 students. 59 students answered Yes(blue) while 41 students answered No (Red).

The condition called syphilitic gumma is only known to 55 participants, this oral manifestation is unaware of the remaining 44 participants.

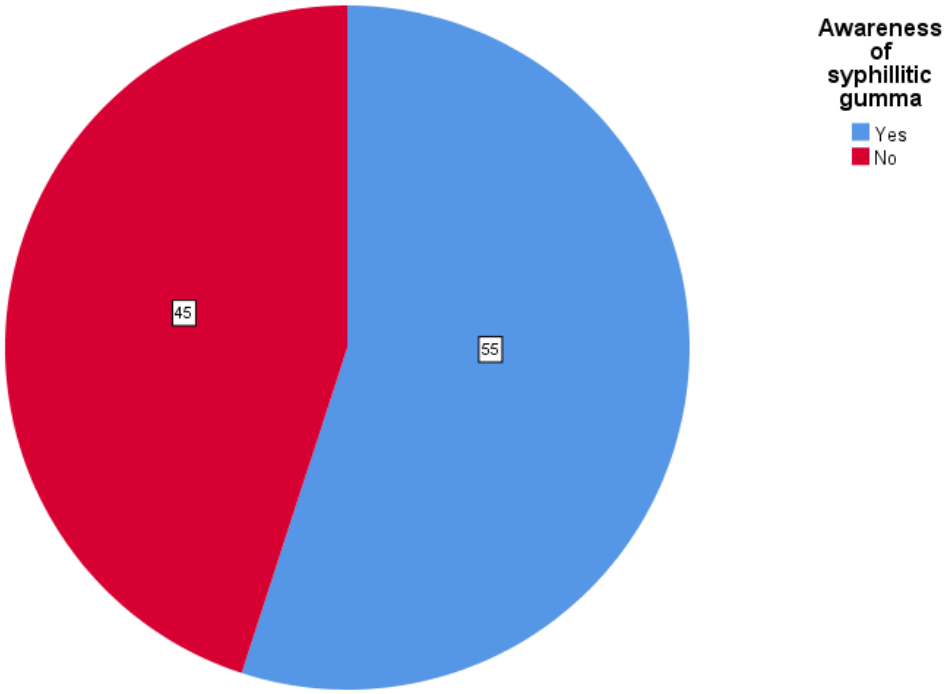

Figure 5 :Awareness of syphilitic gumma.. The pie chart shows the awareness of students towards the term syphilitic gumma among 100 students. 55 students answered Yes(blue) while 45 students answered No (Red).

Only 48 participants are confident enough to give a diagnosis of syphilis with 52 of the students saying they were unable to confidently diagnose a patient with syphilis.

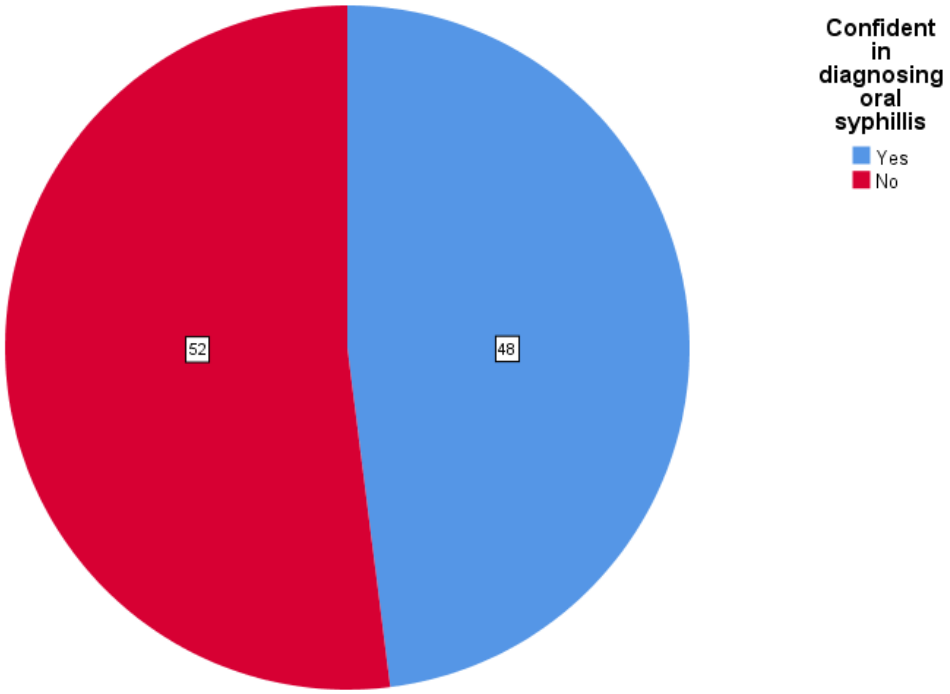

Figure 6 :Confidence in diagnosing oral syphilis.. The pie chart shows the confidence of students in diagnosing oral syphilis among 100 students. 48 students answered Yes(blue) while 52 students answered No (Red).

The treatment plan for syphilis is known to only 57 of participants, remaining 43 participants selected no for this question.

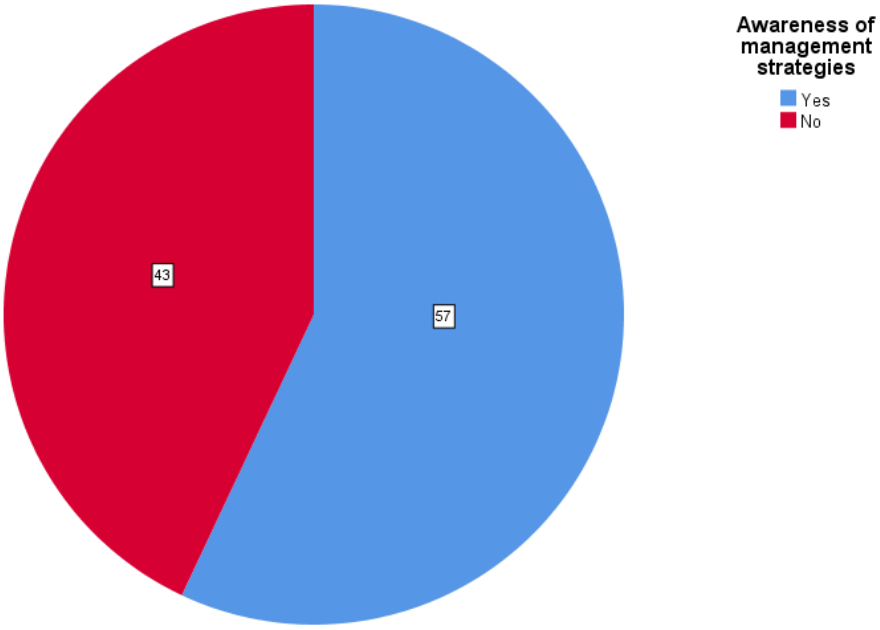

Figure 7 : Awareness of management strategies.. The pie chart shows the awareness of students on the management strategies in oral syphilis among 100 students. 57 students answered Yes(blue) while 43 students answered No (Red).

48 participants will suggest a surgical correction of syphilis, with the remaining saying they would not suggest a surgical recovery.

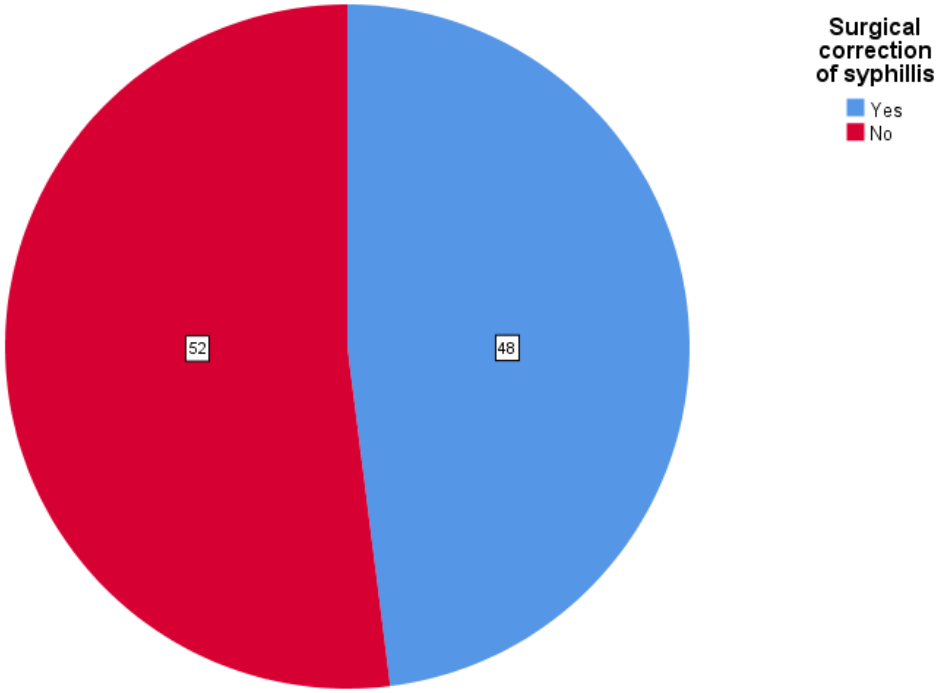

Figure 8 :Surgical correction of syphilis.. The pie chart shows the awareness of students towards the surgical correction of syphilis among 100 students. 48 students answered Yes(blue) while 52 students answered No (Red).

The World Health Organisation has claimed that syphilis continues to be a major global health threat causing an estimated 12 million infections each year. This statement shows lack of awareness among the people all over the world, and it will be the major cause for the increase in the number of cases of syphilis over the last decade. An reviewed awareness campaign is much needed for both private practitioners as well as the public. As for medical practitioners such as dentists, the awareness of oral manifestation of syphilis and its management should be increased during their college life[22]. According to present study, more than half of the participants answered that they knew about the mode of transmission of syphilis but only half of them said yes when asked about fundamental lesion associated with this disease.[23,24]

In 2009 Bruce et al.,stated that clinical manifestations of acquired syphilis, on the basis of its activity and infectivity phases, are classified into three well-described stages: primary, secondary, and tertiary that have important and different clinical, public health, and surveillance implications. This statement was correlated with the confidence of participants to diagnose syphilis and not even half of them were confident. Understanding of Bruce's statement plays an important role in diagnosis syphilis through oral manifestation.[25] In addition, Leau et al. confirmed that oral lesions arise in a high percentage of patients and are rarely the only manifestation of infection.[26,27] Examination of oro-pharyngeal showed highly non-specific features such as mucous patches, ulcers, papules, plaques often associated with a nonspecific pharyngitis,

tonsillitis, and laryngitis, sometimes also presenting as isolated cervical lymphadenopathy, which is presented by Ficarra and Carlos et al.[28] This is due to the stage which had a multitude of diverse presentations, syphilis is labeled the 'great imitator', according to Domantay-Apostol et al.[29,30]

In an article by French et al., stated that tertiary syphilis is characterized by three main manifestations: gummatous syphilis, neuro-syphilis and cardiovascular syphilis. A gumma is a painless granulomatous-like lesion usually localized on the skin, bone, and liver, but gumma lesions can affect any organ. In the oral cavity, the gumma may affect the palate (midline), tongue or tonsils.[31]In this study, only half of participants knew about syphilitic gumma. This data proved that there are presence of unaware dentists about oral manifestation of syphilis. Captline et al. had reported that atrophic or interstitial glossitis is also described in some case reports as well as salivary gland (parotid) involvement. Moreover, there are eventual bone destruction, palatal perforation, and oro-nasal fistula formation in this stage. When it is associated with infection in the jaw, an extensive osteonecrosis, characterized by pain, swelling, suppuration, and sequestration with this disease.[32]

In an article reported by Leusi et al., their cases described oral manifestations of syphilis are multiple and highly variable, and often detected in secondary stages. In their study, only 8% of patients and the 25% had, respectively, primary and tertiary lesions. The evaluation of the morphology of the oral lesions in all stages of the disease revealed peculiar data. In line with the literature, primary syphilis is detected as ulcer in all patients, while secondary syphilis is detected as ulcer in about 50% of cases. In contrast to published data, mucosal patches are detected in only 16% of patients and any evidence of leukoplakia-like lesions. Interestingly, case 2 affected by syphilis in the secondary stage mimicking a blistering mucositis is never described in the current literature.[33] Another interesting data is the necrosis of the dorsum of the tongue in patients with tertiary disease.

These statements proved that dentists are confused with the differential diagnosis. In addition, syphilis are only exposed by theory for the current budding dentists.Yes, syphilis are very rare to be seen in dental clinics in South India especially. Therefore in the present study the participants had so many doubts in planning treatment as we can see the results showed only 57 participants answered yes with the question regarding treatment plan for syphilis. To minimize the risk of spread of the infection, dentists have an important part to play in prevention and rapid diagnosis.

CONCLUSION

Awareness about management of oral manifestation of syphilis has to be improved among dental students. The analysis of a suspected patient's clinical history, combined with physical examination and serological assays normally affords a conclusive diagnosis of the disease, and biopsy is not normally required as an initial diagnostic resource. Therefore, the dental student should be aware of the most common oral manifestations of syphilis in the oral mucosa so as to play a role not only in the management of syphilis, but also in the diagnosis of the disease.

Further researches are needed to assess better diagnostic tools, the proper treatment protocols both in early and late syphilis immunocompetent and immunosuppressed patients with evidence from multicentre controlled trials.[34]

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AUTHORS CONTRIBUTION
SiveshSangarcontributed to the study design, data collection, data analysis, preparation of the manuscript.
DhanrajGanapathycontributed to the study design , data collection, and preparation of the manuscript.
Kiran Kumar contributed to the study design, preparation of the manuscript and proofreading.
Visalakshi**Ramanathan**contributed to the study design, preparation of the manuscript and proofreading.

CONFLICT OF INTEREST
This research project is self funded.There is no conflict of interest.

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