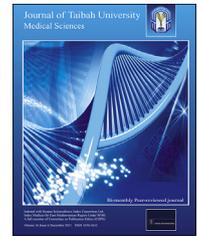Taibah University

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Original Article

Effect of periodontal treatment on oral health-related quality of life — A randomised controlled trial

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الملخص

أهداف البحث: أمراض اللثة مرض معدي مزمن يصيب اللثة، يؤدي في النهاية إلى فقدان الأسنان مع تأثير سلبي على جودة الحياة. تركز معظم البحوث في هذا المجال على تقييم المعايير السريرية بدلا من النتائج المستندة على المريض. في الوقت الحالي، تكتسب هذه المعايير أهمية، وكذلك نتائج علاج الأمراض المزمنة على جودة الحياة. تهدف هذه الدراسة إلى تقييم تأثير أمراض اللثة وعلاجها على جودة الحياة المرتبطة بصحة الفم.

طرق البحث: قمنا بتوظيف ٩٠ مشاركا تم تقسيمهم إلى مجموعتين. مجموعة الاختبار (ن=٤٥) الذين تلقوا علاجا غير جراحي للثة متبوعا بجراحة السديلة اللثوية ومجموعة التحكم (ن=٤٥) الذين تلقوا علاجا غير جراحي للثة فقط. تم تسجيل العلامات السريرية، ومؤشر اللويحة، ومؤشر اللثة، وعمق جيب اللثة، ومستوى التعلق السريري والحركة. تم استخدام استبانة جودة الحياة المرتبطة بصحة الفم لتقييم المجالات الوظيفية والجسدية والاجتماعية والنفسية عند البداية، ٣ و٦ أشهر.

النتائج: كان متوسط عمق جيب اللثة في مجموعة الاختبار ٦.٩ ± ٠.٣٨، ٣.٢ ± ٠.٣٦ و٣.٥ ± ٠.٥، وفي المجموعة الضابطة ٥.٨ ± ٠.٦٧، ٣.١٣ ± ٠.٢١، و٣.٧٣ ± ٠.٤٥ عند البداية و٣ و٦ أشهر على التوالي. كان متوسط مستوى التعلق السريري في مجموعة الاختبار ٧.٠٧ ± ٠.٤١، و٣.٥٦± ٠.٢٧ و٣.٧٤± ٠.٣٠، و٦.٠٨± ٠.١٦. وفي المجموعة الضابطة ٤.٠٢± ٠.١٧، و٤.١٦± ٠.١٩ عند البداية، ٣ و٦ أشهر على التوالي. أظهر كلا ذراعي العلاج انخفاضا في جميع المتغيرات السريرية وكانت ذات دلالة إحصائية في المجموعة الجراحية. لوحظ انخفاض أكثر جوهرية في درجات مظهر تأثير صحة الفم في

المجموعة الجراحية (متوسط الفرق–٢٥.٠) مقارنة بالمجموعة غير الجراحية (متوسط الفرق–٥.٠).

الاستنتاجات: في هذه الدراسة، كان للعلاج غير الجراحي للثة وجراحة السديلة اللثوية تأثيرا إيجابيا على جودة الحياة المرتبطة بصحة الفم من خلال تحسين العلامات السريرية، لكن جراحة السديلة اللثوية كان لها نتائج أفضل بكثير من حيث تحسين جودة الحياة.

الكلمات المفتاحية: صحة الفم؛ أمراض اللثة؛ جيب اللثة؛ مستوى التعلق السريري؛ نوعية الحياة

Abstract

Objectives: Periodontal disease is a chronic, infectious gum disease, which eventually leads to tooth loss, adversely affecting quality of life (QoL). Most of the research in this area focuses on evaluating clinical parameters rather than patient-based outcomes. Currently, these parameters are gaining importance along with treatment outcomes of chronic diseases and QoL. This study evaluates the impact of periodontal disease and its treatment on oral health-related quality of life (OHRQoL).

Methods: We recruited 90 participants who were divided into two groups. One was the test group (n = 45) that underwent non-surgical periodontal therapy (NSPT) followed by periodontal flap surgery (SurgPT). Second was the control group (n = 45) that underwent only NSPT. Clinical parameters, plaque index, gingival index, periodontal/probing pocket depth (PPD), clinical attachment level (CAL), and mobility were recorded. An OHRQoL questionnaire was used to assess the functional, physical, social, and psychological domains at baseline, three, and six months.

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Results: The mean PPD in the test group was 6.9 ± 0.38, 3.2 ± 0.36, 3.5 ± 0.5, and 5.8 ± 0.67, 3.13 ± 0.21, 3.73 ± 0.45 in the NSPT group at baseline, 3, and 6 months, respectively. The mean CAL in the SurgPT group was 7.07 ± 0.41, 3.56 ± 0.27, 3.74 ± 0.30, and 6.08 ± 0.16, 4.02 ± 0.17, 4.16 ± 0.19 in the NSPT group at baseline, 3, and 6 months, respectively. Both treatments resulted in reduction in all clinical parameters and were statistically significant in the SurgPT group ($p < 0.001$). Oral Health Impact Profile scores substantially decreased in the SurgPT group (mean difference-25.0) compared to the NSPT group (mean difference-5.0) (p-0.001).

Conclusions: In this study, NSPT and SurgPT had a positive impact on OHRQoL by improving clinical parameters, but SurgPT had substantially better outcomes in terms of improved QoL.

Keywords: Clinical attachment level; Oral health; Periodontal diseases; Periodontal pocket; Quality of life

Introduction

Quality of life (QoL) is essentially a measure of the well-being of an individual that includes the physical, emotional, and social aspects.[1] Based on the Global Oral Health Program of the World Health Organization (WHO), oral health-related quality of life (OHRQoL) has been recognised as a crucial element of an individual's general well-being and health. The dynamics of the current clinical practice are based on patients' subjective evaluation of the treatment rather than the conventional methods like clinical parameters, and this is particularly true in case of chronic diseases like periodontal diseases.[2]

Periodontitis is an inflammatory condition of the tooth-supporting structures with symptoms, such as bleeding gums, tooth mobility, drifting of teeth, and tooth loss, which are the most common endpoints of the disease.[3] It can compromise the ability of an individual to eat, speak, socialise, and perform various daily activities, adversely affecting individuals and their QoL. Durham et al. (2013) used the UK-Oral health-related quality of life (OHRQoL-UK) and Oral Health Impact Profile-49 (OHIP-49) questionnaires and reported that individuals suffering from chronic periodontitis have significantly lower OHRQoL compared to periodontally healthy individuals.[4] Recently, Fuller et al. (2019) assessed the impact of different forms and severity of periodontitis on the OHRQoL and reported that patients with aggressive periodontitis and increased severity of periodontitis exhibit lower overall OHRQoL.[5] A previous study reported that periodontal disease is associated with adverse systemic conditions, such as cardiovascular disorders and respiratory diseases.[6] Corroborating their findings, in a recent survey conducted on juvenile idiopathic arthritis (JIA) patients, Polizzi et al. reported that periodontitis is significantly associated with the activity and duration of JIA while negatively influencing the overall OHRQoL of patients.[7] Traditionally, all outcomes of surgical and nonsurgical periodontal therapy are assessed using several surrogate measures, such as Gingival Index (GI), Plaque Index (PI), Probing Depth (PD), Bleeding Index, Clinical Attachment Level (CAL), and radiographic assessment of the alveolar bone. However, improvement in these clinical parameters cannot be perceived and appreciated by the patient. True endpoints of periodontal therapy that the patients perceive are subjective and correlate with conventional clinical measures.

Patient-based outcomes, such as reduction in pain and bleeding after periodontal therapy differ from the clinical endpoints of gain in CAL and reduction in PD. Hence, there is a need to know the influence of non-surgical periodontal therapy (NSPT) and surgical periodontal therapy (SurgPT) on OHRQoL. Meticulously performed periodontal therapy restricts any further progression of disease and results in the stability of the periodontium. However, it may often leave tell-tale signs of the ravages of the disease. Locker (2004) reported that understanding the effects of periodontal disease and its treatment outcomes could help elucidate the burden of periodontal disease on the well-being of the general population and improve access to oral health care.[8] In a recent review, Botelho et al. (2020) stated that NSPT markedly raised the OHRQoL of periodontitis patients at least for a short period of three months.[9] Theodoridis et al. (2020) assessed both the patient-centred and clinical outcomes and found that NSPT mildly improved the OHRQoL of patients, while there was no overall impact of SurgPT.[10] In another review, Khan et al. (2020) defined NSPT as the 'gold standard' approach that can be employed to improve patient-based outcomes and reduce co-morbidities.[11] Some studies have also shown that the extent of oral disease independently affects the QoL of patients. For instance, in a survey of a Brazilian cohort, it was revealed that the extent of gingival inflammation, which is often considered to be a precursor to periodontal disease, i.e. spread to the whole mouth or limited to the anterior portion of the mouth, independently affects the OHRQoL of patients.[12]

Very few studies have addressed the problems of OHRQoL arising due to periodontal procedures. Therefore, this study assesses the influence of periodontal disease and treatment on the oral health-related quality of life (OHRQoL) using a randomised clinical trial.

Materials and Methods

The study protocol and ethical approval

This randomised, single-centre, double-blinded prospective clinical trial was conducted between February 2018 and December 2018 at the Vishnu Dental College, with IEC No: VDC/IEC/2016/62 and registered under the Clinical Trial Regulation of India (CTRI), with no. CTRI/2018/11/016316. All the clinical procedures were executed according to the guidelines of the Declaration of Helsinki and the Good Clinical Practice informed patient consent. The CONSORT guidelines were followed (Figure 1).

Patient population

Sample size analysis was done using the G Power 3.1 software based on an effect size of 0.67, and with an alpha level of 0.05 and 20% dropout rate, it was estimated to be 90 patients. Patients aged 18 to 60 years (mean age: 42 years) were included in the study and were randomised into either of the groups using a simple coin toss method.

NSPT group: 45 patients received only non-surgical periodontal therapy.

SurgPT group: 45 patients received non-surgical periodontal therapy followed by periodontal flap surgery.

After one month, three months, and six months, each patient was followed-up on.

Patient eligibility

Patients with moderate (i.e. CAL of 3–4 mm) to severe periodontitis (i.e. $\geq$ 5 mm) based on the 1999 international workshop of periodontitis classification of periodontal diseases,[13] no history of periodontal therapy in the last six months, a full complement of teeth except third molars, and systemically healthy, with no contraindications of periodontal surgery were included.

Patients with a history of medication usage affecting their periodontal status, teeth with grade III mobility, grade II and III furcation involved teeth with clinical attachment loss, significant active caries or other oral diseases, uncontrolled systemic disorders, and pregnant or lactating females were excluded.

Screening procedure

The preliminary examination included an assessment of dental and medical history of the patients, and none of the patients required occlusal corrections before the treatment.

All the patients underwent NSPT, including scaling and root planning (SRP) and motivation for plaque control. Four to six weeks after phase I therapy, the patients underwent periodontal evaluation (Figure 2a–c). Those in test group underwent surgical periodontal therapy (Figure 3a–c). Surgery was postponed until the plaque and gingival index scores were $\leq$1, with firm and fibrous gingival condition. Patients who were not willing for SurgPT after NSPT were excluded.

Surgical protocol

All the surgeries were performed using 2% lignocaine with adrenaline (1:2, 00,000) under aseptic conditions by one investigator.

A full thickness mucoperiosteal flap without vertical incisions was reflected from the bone till the extent of the teeth involved. After gaining access to the base of the pocket, second-time root planning was performed manually to ensure the removal of subgingival calculus and altered cementum. After complete debridement, the mucoperiosteal flap was repositioned and secured with 5–0 Mersilk sutures using the continuous sling method of suturing.

Post-operative care

All the participants received antibiotics (500 mg Amoxicillin) and analgesics (50 mg Diclofenac) for three days. They refrained from brushing at the surgical site and were instructed to instead rinse with 0.2% chlorhexidine gluconate mouthwash twice daily for a week. After one week, periodontal dressing and the sutures were removed, and the participants were reinforced with oral hygiene instructions.

Recording the periodontal parameters

A stent was used to standardise the periodontal clinical parameters before and after NSPT and SurgPT while measuring the pocket depths. Periodontal parameters, including PI (Silness and Loe),[14] GI (Loe and Silness),[14] mobility (Waserman's Index),[15] PD, and CAL, were recorded to the nearest millimetre using UNC-15 probe in both NSPT and SurgPT sites at baseline, three months, and six months. To eliminate interexaminer variability, all the measurements were recorded by a single examiner (therefore, kappa value was not calculated). Prior to the start of the study, the principal investigator underwent training and calibration under senior periodontist and was found to be consistent in recording clinical parameters.

All the participants were given a questionnaire in vernacular language at baseline. It comprised of 20 questions to examine the impact of periodontal health on a patient's OHRQoL. The questionnaire was the modified version of OHIP-14,[16] which was modified to suit the requirements of the local population. Apart from the questions mentioned in the OHIP-14, questions on commonly encountered problems due to periodontal disease, such as food impaction, sensitivity, painful gums, and aesthetic concerns were included. This modified, self-administered questionnaire was validated using the back-and-forth translation method from English to the local language through a pilot study. The same was used to assess the effect of periodontitis on OHRQoL. Each question had five options arranged in ascending order. OHIP questionnaire was administered at baseline and at six months' follow-up after periodontal therapy. The individual scores were added to obtain the total score, and the oral health rating was out of 100. None of the participants developed any other oral or general disease conditions during the follow-up interval.

Statistical analysis

SPSS 21.0 software was used for statistical analysis. Descriptive statistical analyses were expressed as mean $\pm$ standard deviation. Intergroup comparisons with means of clinical parameters were made by the ANOVA test. Intergroup comparison of mobility was made by the Friedman test. Comparison of the OHRQoL for the NSPT group and SurgPT group and intergroup comparisons of all the clinical parameters were made by the t-value.

Results

The study included 90 participants, with 41 females and 49 males. Their age ranged from 18 to 60 years (mean age: 42 years). In both groups, following NSPT and SurgPT, PI and GI scores were reduced from baseline, three, and six months after surgery and were statistically significant ($p < 0.001$). All the patients acquired the requisite skills to maintain a near plaque-free dentition due to the consistent reinforcement of oral hygiene guidance and supervision. However, there was
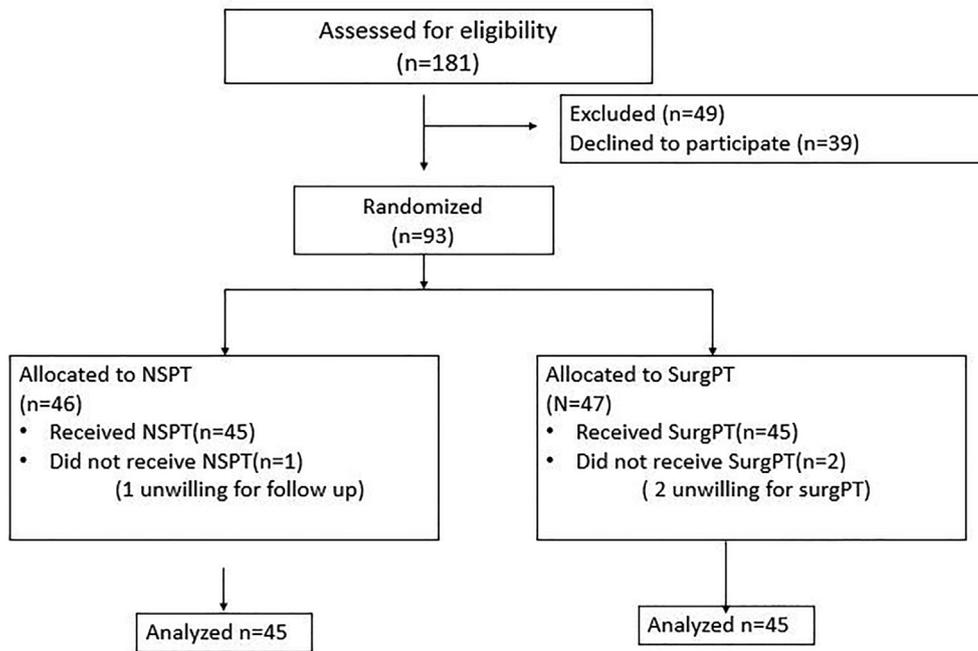
Figure 1: CONSORT flow chart.

Figure 2: Control group-a) pre-operative probing depth of 5 mm; b) immediately after SRP; c) 6 months post-operative probing depth of 3 mm.
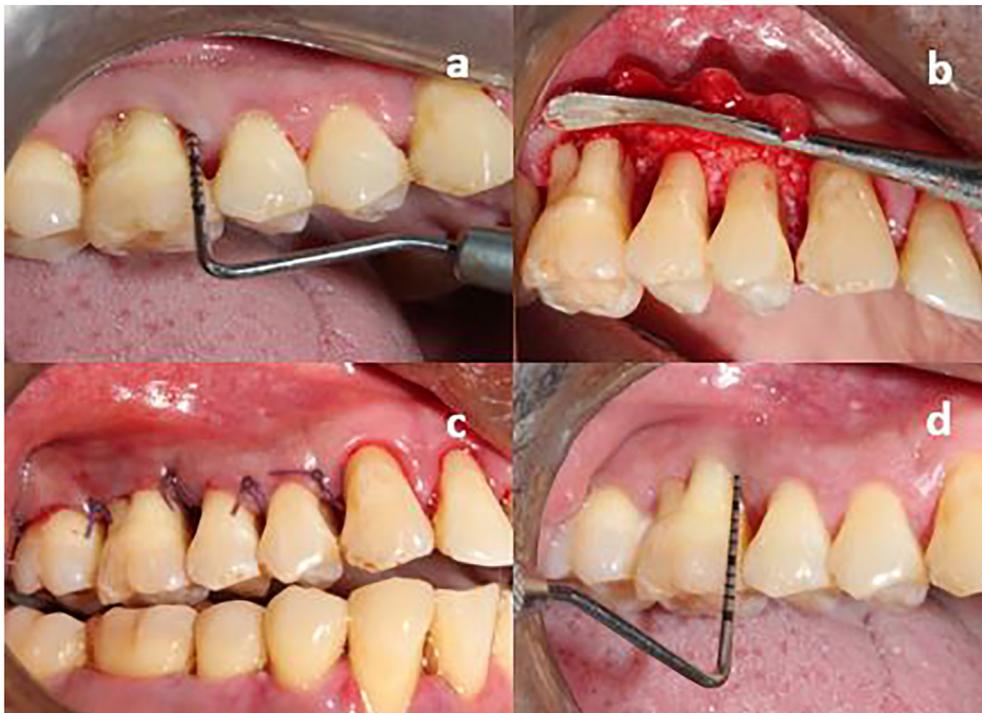

Figure 3: Test group-a) pre-operative probing depth of 8 mm; b) flap elevation and complete debridement; c) suturing done; d) 6 months post-operative probing depth of 4 mm.

Table 1: Intragroup comparison of clinical periodontal parameters in control group.

	Time	Mean ± SD	P value
Plaque Index	Baseline	2.00 ± 0.65	0.00
	3 Months	1.35 ± 0.39	
	6 Months	0.63 ± 0.27	
Gingival Index	Baseline	1.87 ± 0.64	0.00
	3 Months	1.06 ± 0.43	
	6 Months	0.51 ± 0.35	
PPD	Baseline	5.80 ± 0.67	0.00
	3 Months	3.13 ± 0.29	
	6 Months	3.73 ± 0.45	
CAL	Baseline	6.08 ± 0.16	0.00
	3 Months	4.02 ± 0.17	
	6 Months	4.16 ± 0.19	
Mobility	Baseline	1.93 ± 0.70	0.00
	3 Months	1.20 ± 0.41	
	6 Months	1.06 ± 0.25	

Table 2: Intragroup comparison of clinical periodontal parameters in test group.

	Time	Mean ± SD	P value
Plaque Index	Baseline	2.34 ± 0.73	0.00
	3 Months	1.76 ± 0.69	
	6 Months	1.05 ± 0.73	
Gingival Index	Baseline	1.96 ± 0.74	0.00
	3 Months	1.40 ± 0.59	
	6 Months	0.78 ± 0.56	
PPD	Baseline	6.90 ± 0.38	0.00
	3 Months	3.20 ± 0.36	
	6 Months	3.50 ± 0.50	
CAL	Baseline	7.07 ± 0.41	0.00
	3 Months	3.56 ± 0.27	
	6 Months	3.74 ± 0.30	
Mobility	Baseline	2.20 ± 0.56	0.00
	3 Months	1.13 ± 0.35	
	6 Months	1.00 ± 0.00	

Table 3: Intergroup comparison of clinical periodontal parameters.

Variable	Duration	Group	Mean ± SD	P-value
Plaque Index	Baseline	NSPT	2.00 ± 0.65	0.00
		SurgPT	2.34 ± 0.73	
	3 months	NSPT	1.35 ± 0.39	0.00
		SurgPT	1.76 ± 0.69	
	6 months	NSPT	0.63 ± 0.27	0.00
		SurgPT	1.05 ± 0.73	
Gingival Index	Baseline	NSPT	1.87 ± 0.64	0.00
		SurgPT	1.96 ± 0.74	
	3 months	NSPT	1.06 ± 0.43	0.00
		SurgPT	1.40 ± 0.59	
	6 months	NSPT	0.51 ± 0.35	0.00
		SurgPT	0.78 ± 0.56	
PPD	Baseline	NSPT	5.80 ± 0.67	0.00
		SurgPT	6.90 ± 0.38	
	3 months	NSPT	3.13 ± 0.29	0.00
		SurgPT	3.20 ± 0.36	
	6 months	NSPT	3.73 ± 0.45	0.00
		SurgPT	3.50 ± 0.50	
CAL	Baseline	NSPT	6.08 ± 0.16	0.00
		SurgPT	7.07 ± 0.41	
	3 months	NSPT	4.02 ± 0.17	0.00
		SurgPT	3.56 ± 0.27	
	6 months	NSPT	4.16 ± 0.19	0.00
		SurgPT	3.74 ± 0.30	
Mobility	Baseline	NSPT	1.93 ± 0.70	0.00
		SurgPT	2.20 ± 0.56	
	3 months	NSPT	1.20 ± 0.41	0.00
		SurgPT	1.13 ± 0.35	
	6 months	NSPT	1.06 ± 0.25	0.00
		SurgPT	1.00 ± 0.00	

no statistical significance in the intergroup relation (Tables 1−3).

In the SurgPT group, mean PD was 6.9 mm, 3.2 mm, and 3.5 mm at baseline, 3, and 6 months, respectively; the reduction was statistically significant (Figure 3a, d). In the NSPT group, mean PD was 5.8 mm, 3.13 mm, and 3.73 mm at baseline, 3, and 6 months, respectively; the reduction was statistically significant (p-value: 0.001) (Figure 2a, c). Mean PD was significantly different between the two groups at baseline; however, the difference was not significant at three and six months. In the test group, mean CAL was 7.07 mm, 3.56 mm, and 3.73 mm at baseline, 3, and 6 months, respectively; the reduction was statistically significant. In the NSPT group, mean PD was 6.08 mm, 4.02 mm, and 4.16 mm at baseline, 3, and 6 months, respectively; the reduction was statistically significant (p-value: 0.001). Mean CAL was significantly different between the two groups at baseline, 3, and 6 months (Table 3).

There was a significant improvement in the teeth, with initial mobility in both groups. The Wasserman's mobility index scores reduced in both the groups from baseline to 3 and 6 months (P < 0.001) (Tables 1−3).

The mean overall OHRQoL scores improved significantly in both groups. At baseline, OHRQoL scores were considerably higher in the SurgPT group than in the NSPT group. However, at six months, both the groups showed similar OHRQoL scores (Table 4).

Most patients complained about bleeding gums, loose teeth, discomfort in eating, bad breath, sensitivity, and food lodgement. Nearly 75% of patients in both groups did not feel that their general well-being was affected by their gum problems. Further, 93% of patients from both groups had no idea that their general systemic health could be affected by periodontal problems. In the SurgPT group, at baseline, the patients still had persistent issues related to bleeding gums, loose teeth, discomfort in eating, bad breath, sensitivity, food lodgement, etc. However, at six months of re-evaluation, there was a drastic improvement in all these conditions,

Table 4: Intragroup comparison of OHRQoL scores.

Groups	Duration	Mean values	P value
SurgPT group	Baseline	57.13	0.001*
	6 months	22.13	
NSPT group	Baseline	25.20	0.001*
	6 months	20.20	

Asterix denotes the obtained value is statistically significant.

and patients had no significant problems related to OHR-QoL (Table 4).

In both the groups at the end of the study period, the participants showed 100% satisfaction in terms of tooth loss, improvement in dietary intake, taste sensation, general well-being, ability to maintain oral hygiene, reduced breath odour, work restrictions, and improvement in self-confidence. Except for one patient in the SurgPT group, none were worried about losing their teeth. Two patients in the SurgPT group complained of occasional pain in the gums. NSPT group participants reported less sensitivity and food lodgement (Table 4).

Discussion

Periodontal disease is a chronic, infectious disease affecting individuals' quality of life. The two most used periodontal procedures are NSPT, mainly comprising of SRP, optimal plaque control, and SurgPT comprising of SRP, plaque control, and periodontal flap surgery. Hence, this study evaluated the effect of periodontal disease and its treatment approaches on OHRQoL.

Although prescribed medications might alleviate the inflammatory response, they might last for a while. Hence, the absence of inflammation was taken as an indicator for the maintenance of gingival health; it does not reflect disease progression. GI is a predictor of future attachment loss, with bleeding being the first inflammatory clinical sign. There was a significant improvement in the scores from baseline to six months in both groups in the current study.

Although there are many indices and scales, such as the General Oral Health Assessment Index, OHIP-14, OHR-QoL-UK, and McGill pain questionnaire, none is fully suitable for the local population.[17−20] Hence, a newly-designed questionnaire that assessed patients' perception on a scale of 0−5, from the least affected to the worse affected scenario was used in this study, which is almost in agreement with the 5-point Likert scale of the GOHAI. A higher score was assigned to the worse scenario, making it easier to explain to the patient and set targets for improvement. The patients belonging to the SurgPT group who had poorer periodontal status had higher scores reflecting poor oral health. The mean OHRQoL scores of patients in the SurgPT and NSPT groups were 57 and 25, respectively. This is also in agreement with earlier studies where upon treatment, the mean OHRQoL score in the surgical group reduced to 22, which corresponded to improvement in periodontal parameters.[2,21,22] It is noteworthy that the QoL scores of the SurgPT group patients postoperatively were comparable to those of the NSPT group patients. This further proves that properly performed periodontal surgery yields good results in well-motivated patients, and this too is in accordance with earlier studies.[23−25]

Another interesting fact is that most of the potentially disturbing factors were never perceived by most patients unless they were informed about them. Few patients believed that periodontal diseases could affect the general health, and none of them felt that gum diseases affected their job. On the other hand, not many patients felt that their self-confidence was affected by periodontal disease. It was only after the treatment and after having been asked that many patients realised their ability to taste food had improved. All the above findings contradict the conclusions in studies done in western countries where the level of dental consciousness is high and the people's perception differ. In this study, most patients were from the lower middle class or poorer sections of society; hence, it is reasonable to assume that minor problems did not affect them or their perception.[23]

Most patients had issues with gum bleeding, tooth mobility, halitosis, dental sensitivity, food lodgement, pain, and discomfort. The majority of patients, particularly those in the SurgPT group reported that they experienced frequent dental difficulties.

It is well known that inflammatory gingival and periodontal conditions result in gingival bleeding, which alarms the patient and is one of the main presenting symptoms that dissuaded the patients from brushing effectively. It is also established beyond any doubt that periodontal therapy reduces or eliminates bleeding from gums. This is one of the most tangible benefits appreciated by patients in this study.

Mobile teeth severely dent the patient's well-being and result in the fear of losing teeth, which is often a dramatic finding that makes one seek dental treatment. Reduced mobility enhances the patient's confidence and is the most perceived benefit of periodontal therapy. After surgery, none of the patients developed mobility, and the mobility before treatment was greatly reduced or eliminated. This also might have contributed to improving the OHRQoL scores, which was in accordance with previous studies.[23]

Though it is less common, halitosis contributes to the loss of confidence and affects the social behaviour of people. This study showed a significant reduction in halitosis and improvement in OHRQoL scores. Other factors contributing to the improvement in OHRQoL included reducing the sensitivity, pain, and discomfort, which led to positive patient perception.

A notable feature of this study is the patient's acceptance of periodontal flap surgery. While demonstrating considerable improvement in OHRQoL after NSPT, earlier studies did not show a marked difference between phase I and phase II of periodontal therapy. However, in the present study, greater improvement was observed after periodontal flap surgery, improving the OHRQoL of patients in the test group compared to those in the control group at the end of the treatment period.

Strengths of this study

To the best of our knowledge, this is the first study to look at the impact of periodontal disease and its treatment on OHR-QoL among the Indian population. While delivering periodontal therapy, this study attempted to delve deep into patients' perception of gum disease and its treatment by framing 20 questions with 5 gradings, enabling the participants to differentiate one from the other in vernacular language.

Limitations

Patients with an incomplete dentition, advanced tooth mobility, and advanced furcation involvements were excluded from the study; however, they represent truly severe periodontitis cases, which could alter the findings, and

therefore, this necessitates further investigation. Moderate sample size and a follow-up of only six months are the other limitations.

Conclusion

The OHRQoL status in patients with advanced periodontal diseases drastically improved post treatment. With SurgPT, the overall patients' acceptance of periodontal therapy was high and encouraging. Most patients with periodontal disease felt that persistent bleeding from the gums, bad breath, loose teeth, tooth sensitivity, pain, and discomfort were the major causes of feeling unwell in the mouth. In contrast, very few patients thought that periodontal problems could be risk factors for systemic illness and could contribute towards the loss of self-confidence. No patient was affected psychologically by periodontal disease.

Clinical implications

Beyond clinical indicators, OHRQoL can be used to evaluate the outcome of periodontal therapy since it provides an insight into the implications of periodontal therapy. In cases of severe periodontitis, further research is needed. Further, establishing its relationship to clinical indicators over time in a larger population is also required.

Source of funding

Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

The Institutional Ethics Committee approved the study protocol, with IEC No: VDC/IEC/2016/62 on 22-11-2016 and is registered under Clinical Trial Registry of India (CTRI), with no. CTRI/2018/11/016316.

Authors' contributions

BV, KSVR conceived and designed the study; KSV, NVSG, and PSG acquired the data; and CD and MA conducted data analysis and interpreted the results. BV, KSVR, and NVSG wrote the initial and final drafts of the manuscript, and MA provided logistic support. All authors drafted the manuscript and designed the tables with critical revisions. All authors discussed the results and commented on the manuscript. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Acknowledgment

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