Original Article

Knowledge, Attitude & Perception of Patients about Manual VS Ultrasonic Scaling and its Polishing Treatment

Manual VS Ultrasonic Scaling

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ABSTRACT

Objective: To evaluate the clinical efficacy and compare the attitudes of patients towards the benefits and cost of routine scaling and polishing and to compare the experience of using manual versus ultrasonic instruments to scale teeth.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Out Patient Department (OPD) in dental block at Darul Sehet Hospital, Karachi from July 2019 to December 2019.

Materials and Methods: A cross sectional study conducted involving 40 adult volunteers attending Out Patient Department (OPD) in dental block at Darul Sehet Hospital. Participants were healthy adults with no significant periodontal diseases randomly allocated to two groups to receive scaling and polishing.50 patients participated in this study. Patients were randomly allocated to either group. Patients' attitudes towards, and experience of, the scaling and polishing were elicited by means of self-administered questionnaires.

Results: The majority of patients (99%) believed a scaling and polishing was beneficial. Patients considered ultrasonic treatment to be appropriate on significantly more occasions than they did for manual scaling and polishing ($P < 0.001$). Patient discomfort: with ultrasonic scaling 69.2% felt 'a little uncomfortable' or worse compared with 60% of those undergoing manual treatment ($P = 0.072$).

Conclusion: Routine scaling and polishing is considered beneficial by patients. The majority of patients, regardless of treatment method, experience some degree of discomfort when undergoing a scaling and polishing procedure.

Key Words: Benefit of Scaling, Bleeding on Probing, Plaque.

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INTRODUCTION

Dental plaque is defined as soft deposits that form a bio film adhering to the tooth surface, removable and fixed restorations. It has long been recognized that the presence of dental plaque leads to gingivitis, periodontitis and is also capable of reducing the pH at the surface of enamel to the levels that can cause dissolution of the hydroxyapatite crystals and initiates caries. Periodontal literature shows strong evidence of the critical role of periodontal maintenance provides following active periodontal therapy[1,2].

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Nyman et al[3] found the recurrence of pockets in treated but noncompliant patients. Others[4] found an increase in bone loss resulting in greater tooth loss in their noncompliant group. Wilson et al[5] reported that fewer teeth were lost when patients were compliant.

The main goal in the treatment of patients with periodontitis is to establish and maintain adequate infection control in the dentogingival area. Root/pocket instrumentation (scaling and root planning), combined with effective self-performed supragingival plaque control measures, serves this purpose by altering the subgingival ecological environment through disruption of the microbial bio film and suppression of the inflammation. According to systematic reviews (Tunkel et al. 2002, van der Weijden & Timmerman 2002, Hallmon & Rees 2003)[6,7], there is no major difference in the efficacy of debridement techniques using hand- or power-driven instruments in terms of pocket reduction and gain in clinical `attachment.

A key aim of the programme is to encourage the development of an interest in the link between improvements in primary dental care. More recently, Quirynen et al.1995[8] advocated the benefit of performing fullmouth SRP within 24h in order to prevent re-infection of the treated sites from the remaining untreated periodontal pockets.

Another consideration in relation to non-surgically performe scaling and root planning is the extent of root instrumentation required for periodontal healing. The original intention with scaling and root planning was not only to remove microbial biofilm and calculus but also ‘‘contaminated’’ root cementum or dentin in order to prepare a root surface biocompatible for soft-tissue healing.

Prior to the 1980s, ultrasonic scalers tip design limited their use to removal of supragingival calculus, plaque, and stain. A technique described the use of modified tips in a manually adjustable ultrasonic unit that facilitated a more thorough periodontal debridement of all subgingival root surfaces[9]. Studies have shown that these modified tips reach closer to the bottom of a periodontal pocket than do hand instruments, cause less root damage, and are less fatiguing to the operator[10]. Cavitational activity occurs as water touches the vibrating ultrasonic tip. This phenomenon may dislodge plaque and other surface irritants at and slightly beyond the reach of the instrument tip.

The 1996 World Workshop inPeriodontics[11] concluded that: “Due to demands of skill, time, and endurance (both clinician and patient), a technique for scaling and root planning that is instrument driven, requiring less skill, but facilitating a highly efficient removal of plaque and calculus, would appear to be desirable for the average clinical practice. Further, given a choice, it would seem prudent for the clinician to choose an instrument which would minimize damage to the root surface while achieving the desired end-point.”

The American Academy of Periodontology[12] states: “Since the attitudes toward specific mechanical therapy techniques may influence patient compliance with prescribed treatment regimens, patient acceptance of power-driven scalers versus hand instruments is important. Surprisingly, with regard to comfort, very little data exist comparing different types of instrumentation”.

Prior research has concentrated on the effects of scaling and polishing on periodontal health[13]. Little research has been carried out into the attitudes of patients towards this treatment. This trial was designed to address this gap in the knowledge base by investigating, patients ‘attitude towards routine scaling and polishing, and by comparing the experience, again from patients' of using either manual or ultrasonic techniques.

MATERIALS AND METHODS

A cross sectional study conducted from July 2019 to December 2019 involving 40 adult volunteers attending Out Patient Department (OPD) in dental block at Darul Sehet Hospital. A total of 50 patients with an age range of 20 to 50 years each answered a questionnaire. This questionnaire was created so that a meaningful statistical analysis could be completed. Each patient completed the questionnaire anonymously. A key consideration, when developing the protocol, was to limit disruption of the normal routine of the surgery as much as possible.

Participation: Each group was to recruit 25 patients. All adult patients who were dentate generally fit and well, attending for a routine check-up appointment, and who, in the dentist’s clinical opinion, required a simple scaling and polishing were eligible for inclusion in the study. The treatment was defined as: 'non-surgical treatment involving scaling, polishing, and simple periodontal treatment included oral hygiene instruction, requiring only one visit'. A patient's eligibility was determined only after examination by the dentist. No influence was made on the decision of the patient’s choice of treatment.

Inclusion Criteria:

o Male or Female in need of non –surgical treatment.
o History of previous scaling and polishing.
o Aged 20 – 50 years.
o Good general health.
o 20+ permanent teeth (including crowned teeth).
o At least eight teeth must show probing pocket depths (PPD) of ≥5mm and bleeding on probing (BOP).

Exclusion Criteria:

o Requirement for prophylactic (prescaling) antibiotic cover
o Removable prosthesis or orthodontic appliance present
o Existing systemic condition which poses a risk factor for periodontal health e.g. diabetes mellitus
o Medication which is known to affect the appearance or health of the periodontal tissues
o Immunosuppressant state
o Pregnancy

Participants were healthy, with no systemic risk factors for periodontal disease 14 and no clinical evidence of significant periodontal disease. Individual patient trial questionnaires consisted chiefly of closed single or multiple response questions that were developed following a review of the literature. Questionnaires were self-administered and investigated reasons for carrying out the scaling and polishing and attitudes towards this treatment from the patient. Both groups filled out questionnaires once the treatment had been completed and then concealed them in opaque envelopes.

Statistical analysis: Fischer test was conducted to compare patient preference for ultrasonic scaling to patient preference for hand scaling. Overall, respondents found statistical significant result with p value- ($p \leq 0.001$) ultrasonic scaling, better in all respects compared to hand scaling.

RESULTS

Patients had a strong preference (99%) for ultrasonic scaling when compared to hand scaling. Particular

preference for the ultrasonic scaling was registered for effective build-up removal, less irritating sound, clean feeling, less overall pain, more overall efficiency.

Figure 1 summarises the patient's perception for the procedure being performed. Patient's perception for ultrasonic method was more preferable when comparison was done on improved gum condition, esthetic appearances and bad breath.

Figure .2 shows the patients preference for both the procedure. About 48%patients were satisfied with the ultrasonic scaling group and only 2% of people had felt they would prefer hand scaling method instead. About 14% people felt uncomfortable with the use of ultrasonic unit and 34% felt sensitivity while the procedure was being performed. While about 44% patients were satisfied with hand scaling procedure and 6% of patients said they would like to go for ultrasonic scaling instead. About 6% patients complained that they were very uncomfortable and about 20% said that they were little uncomfortable during the procedure.

Figure. 3 shows that patients were more satisfied with their appearance with ultrasonic scaling.

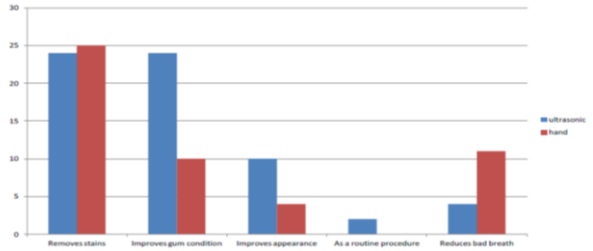

Figure No. 1: Patients Perceptions of procedure being performed

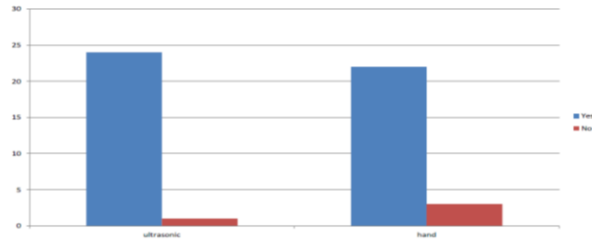

Figure No. 2: Patients preference for both procedures

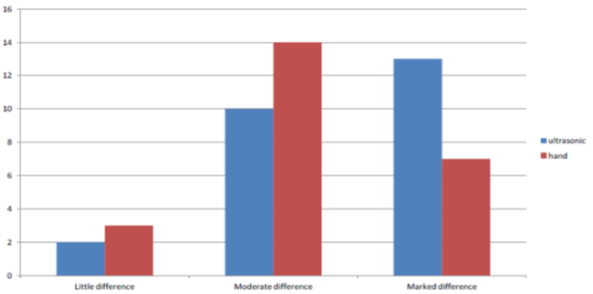

Figure No.3: Patients response to scaling after the procedure

DISCUSSION

The results of this questionnaire indicated that patients preferred ultrasonic scaling with a manually adjustable unit using specialized tips to hand scaling. There was a stronger preference for ultrasonic scaling among patients in practices using this method without any supplementary use of hand instruments.

The ultimate goal with instrumentation of a pathological periodontal pocket is to render the root free from microbial deposits and calculus. However, a number of studies have demonstrated that this goal is frequently not attainable by scaling and root planning (e.g. Waerhaug 1978, Eaton et al. 1985, Caffesse et al. 1986, Brayer et al. 1989, Sherman et al. 1990, Wylam et al. 1993). Despite this fact, non-surgically performed scaling and root planning is an effective treatment modality for periodontal disease, as demonstrated by marked reduction in clinical signs and symptoms of the disease following treatment (for reviews, see Cobb 1996, 2002, Hung & Douglass 2002, van der Weijden &Timmerman 2002, Hallmon & Rees 2003).

A variety of reasons were given to patients why it was necessary to receive a scaling and polishing chief amongst which were calculus, staining, supragingival plaque, and bleeding gums and bad breath.

A randomized control study could further validate the overall patient preference to the ultrasonic technique. There was also an inherent nonresponse bias to the survey. Patients who may have objected to the use of ultrasonic scaling were free to leave the treatment and hence their opinions were not included.

The results of the patient questionnaire support previous findings which indicate that patients believe that scaling and polishing keep their gums healthy, stop tooth decay make their mouth feel good and improve their appearance 15. The majority of participants surveyed thought that scaling and polishing was important to prevent oral health from deteriorating and for their mouths to be aesthetically and socially acceptable.

A recent review of a number of, mostly hospital based, comparisons between these two techniques did note a moderate time saving[16]. The comfort of patients during scaling should be considered, as many nervous dental patients apparently find dental hygiene treatment contributes greatly to their anxiety towards visits for dental treatment.

Undoubtedly, there are difficulties in conducting studies in general dental practice, including time pressures to both patients and dentists and the need to fit in with the priority of providing good patient care. However, this pilot trial has shown that primary care-focused studies can be successfully carried out with a more positive view of the concept of undertaking research in the dental surgery.

CONCLUSION

The results have demonstrated that routine scaling and polishing is considered to be beneficial by patients and that the majority of patients, regardless of whether they

received ultrasonic or manual treatment, experience some degree of discomfort. This study has also demonstrated that it is possible, with careful choice of research topic and a pragmatic approach, to carry out meaningful research in a primary care setting.

Currently, in the absence of a strong evidence base to support (or refute) the clinical effectiveness of single visit scaling and polishing, the beliefs and preferences of patients regarding scaling and polishing are likely to be influential drivers for treatment provision.

As the evidence base for scaling and polishing develops to a stage at which clear guidelines can be developed, it is important and appropriate that dental professionals and patients be a part of the decision-making process. A combination of appropriate communication, support, and professional incentives will be required to overcome barriers and facilitate any future proposed changes to primary care based (state funded) scaling and polishing provision.

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Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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