

The Effect of Povidone Iodine as a Periodontal Disinfectant

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Abstract

Background: Povidone iodine complex might constitute a valuable adjunct to current periodontal therapy because of its broad-spectrum antimicrobial activity, low potential for developing resistance and adverse reactions, wide availability, ease of use and low financial cost. This investigation employed a split mouth study to determine the clinical effects of 10% povidone iodine subgingival irrigation in Periodontitis lesions. **Materials & Methods:** Thirty adults having 2-3 periodontal pocket of >6 mm in each quadrant were included in this study. In each subject the oral cavity was divided into right and left side. The right side of the mouth was treated with Scaling and Root planning plus irrigation of 10% povidone iodine. Left side of the mouth was treated with Scaling and Root Planning (SRP) alone. Patient was recalled for four weeks regularly. In every visit same treatment was given and at last visit a blind examiner recorded the clinical parameters. Data were analyzed using SPSS software version 10 and through independent samples t-test and ANOVA test. **Results:** After four weeks subgingival irrigation with 10% povidone iodine together with SRP showed statistically significant reduction in plaque index, papillary bleeding index and probing depth. But reduction in clinical attachment level was not statistically significant. **Conclusion:** In the present study, 10% povidone-iodine irrigation as an adjunct to SRP favored the non-surgical periodontal therapy due to its broad-spectrum antimicrobial activity.

Keywords: Povidone iodine; Periodontal pocket; Scaling and root planning; Plaque index; Probing depth

Introduction

Periodontitis is a common inflammatory disease of the supporting periodontal hard and soft tissues. [1-3] It results in a progressive destruction of the periodontal fiber apparatus and alveolar bone with subsequent apical migration of the functional epithelium. [4] Bacterial plaque accumulation is considered the primarily etiologic factor. [5,6] Mechanical plaque removal, using curettes and ultrasonic devices, has become a well-documented and effective treatment modality. However, Scaling and Root Planning (SRP) does have certain limitation which include the inability to instrument the deeper periodontal pockets, bifurcation and inability to remove the microorganisms within the tissue lining of the periodontal pockets. Hence antimicrobial therapy targets the susceptible microorganisms in various ecological niches of the oral cavity. [7] The chemical substitutes could alter the environment of the pockets to prevent the growth of pathogens. These have shown greater efficacy when used alongside as an adjunct with SRP. Many different agents have been utilized for irrigation, the most widely studied agents is chlorhexidine and various percentage of povidone iodine solution. [7] Povidone iodine remains an effective antibacterial agent when used directly into the periodontal pocket even at low concentration. The povidone-I has a bactericidal effect against most bacteria including putative periodontal pathogens, fungi, mycobacteria, virus and protozoa. [8] only a few studies have examined the additional antimicrobial effects of povidone

iodine irrigation (sometimes combined with other products) in combination with subgingival debridement. [9-11] The aim of the present study was to evaluate the effect of subgingival irrigation of 10% povidone iodine used as an adjunct to non-surgical periodontal therapy in reducing probing depth and loss of attachment.

Materials and Methods

Ethical clearance was obtained before the start of the study from the ethics committee. Thirty patients with generalised severe chronic periodontitis with periodontal pockets more than 6 mm were included in the present study. Patients of age group 25-60 years who did not suffer from any systemic condition or on medication; presenting with generalised severe chronic periodontitis and each quadrant having at least 2-3 sites with pocket \geq 6 mm were selected. The study was split mouth single blinded study. The mechanical periodontal treatment was performed with ultrasonic device. On the first visit, case history was taken, full mouth periodontal status, the clinical parameters such as Plaque Index (PI), Gingival Index (GI) and Bleeding Index (BI), Probing Depth (PD) and clinical attachment level

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Table 1: Clinical parameters.

	Baseline (Mean ± SD)	Control side (Mean ± SD)	Experimental side (Mean ± SD)	P value
Plaque index	2.52 ± 0.31	2.07 ± 0.24	0.81 ± 0.43	0.001
Papillary bleeding index	99.7 ± 0.94	36.8 ± 7.33	18.6 ± 8.55	0
Periodontal probing depth	3.26 ± 0.33	2.61 ± 0.31	1.58 ± 0.45	0.001
Clinical attachment level	3.54 ± 0.73	3.07 ± 0.50	2.37 ± 0.77	0.028

were recorded with Williams's periodontal probe. At the baseline visit, the right side of the mouth received SRP with ultrasonic scaler and the pockets were irrigated with 1 ml of 10% povidone iodine using syringe (experiment side). The syringe was gently inserted into the depth of the periodontal pocket to assure delivery of irrigant solutions. Repeated irrigation ensured that irrigant solution filled up pockets for a period of 5 min and oral instructions were reinforced. Patients were recalled after one week for every four weeks. And left side of the mouth received SRP and irrigation with normal saline (control side). At last visit clinical parameters were reassessed by blind examiner and the clinical parameters were compared. Statistical analysis data were analysed using SPSS, version 10 and through independent samples t-test, repeated measures ANOVA.

Results

The mean age of the patients was 40 years (29-62) and the no of males were 20 and no of females were 10. Table 1 shows the mean comparison of plaque index; papillary bleeding, probing depth and clinical attachment level at baseline and at the end of the study.

Reduction in the percentage of pockets ≥ 6 mm was more in experimental group is 35% as compared to control group is 38% which was 54% and 50% respectively and are statistically significant. Increase in the percentage of pockets ≥ 3 mm and 4-5 mm as there was decrease in probing depth.

Discussion

SRP is one of the most commonly utilized procedures for the treatment of periodontal disease and has been used as the gold standard periodontal therapy. It was designed to remove dental plaque, calculus and cementum contaminated with toxins.^[12] In the past, these toxins were thought to be so firmly attached to the root surface that extensive cementum removal was required during subgingival instrumentation. In this study, povidone iodine was used as an adjunct to SRP because of its broad-spectrum antibacterial activity, low potential for developing resistance and adverse reactions, wide availability, ease of use and low financial cost.^[13] Cheetham et al.^[14] showed that lipopolysaccharide presence on periodontally involved roots was removed by only 15 light strokes per tooth surface. Thus, systematic root planning to remove cementum does not seem warranted. The present study showed a significant reduction in plaque index, papillary bleeding index, probing depth and gain in clinical attachment on experimental side. The reduction in all clinical parameters is clinically significant due to reduction in inflammation. reduction in plaque index, papillary bleeding index, probing depth were statistically significant; but the gain in clinical attachment was not statistically significant as there

was no bone regeneration. The result of this study was in line with the previous reports of Sindhura et al.^[7] Pandya et al.^[15] A predictive reduction in the level of inflammation and absence of bleeding were also noticed. This is in accordance with study by Cigana et al.^[16] Slow release of iodine in the subgingival area induces the fresh influx of macrophages and T helper cells which help in modulating the wound healing and further reduces the inflammation as shown by Selvaggi et al.^[17] taken together, the present and cited studies suggest that increasing the intensity of antimicrobial control provide a short-term clinical benefit which can be maintained or even enhanced in long term studies. The data also suggest that the addition of an antibacterial agent such as povidone iodine may be cost effective measure to decrease progression of periodontal disease during basic therapy.

In conclusion, there are some data to indicate that povidone-iodine can be used as a component in a rinse to treat gingivitis or as a subgingival irrigant to reduce bacteremia. Furthermore, subgingival irrigation with PVP-I is not recommended as a pretreatment procedure for high-risk patients. At present, its adjunctive role in the treatment of refractory periodontitis is unclear. However, additional studies are needed to delineate and corroborate advantages of using PVP-I during periodontal therapy. Ultimately, incorporating new products or techniques into clinical practice that have withstood a critical assessment will provide patients with the most predictable results.

Limitations of this study

1. The study was short term.
2. The split mouth design carries the risk of transferring povidone iodine from the assigned quadrant to the others.
3. Microbiological assessment of periodontopathic bacteria is required.

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