(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 5, Issue 3, Page No: 1073-1078
May-June 2022

IJMSCR

To Evaluate Efficacy Of Glycyrrhiza Glabra (Mulethi) Extract Gel In Localized Periodontitis: A Randomized Clinical Trial

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Introduction: Glycyrrhiza glabra (G. glabra) is a medicinal plant used in sore throat and other respiratory infections and has anti-inflammatory and antibacterial properties and its efficacy as a mouthwash has been studied previously. Because of its antibacterial effect has immense potential for use as a local drug delivery agent, which has not been investigated.

Aim: To evaluate and compare the effect of G. glabra extract gel v/s curenext ® gel as a local drug delivery agent, in localized pockets.

Methodology: 36 sites with bilateral probing pocket depth ≥ 5mm were selected for the study. After oral prophylaxis, they were randomly allotted as Test site - G. glabra gel (n=18), Control site - Curenext gel (n=18). Clinical parameters evaluated were Gingival index (Loe and Silness), pocket probing depth and CAL at baseline and 30 days.

Result: On Intragroup comparison, there was a statistically significant decrease in all parameters for both the groups, but on the intergroup comparison, the difference was not statistically significant.

Conclusion: G. glabra gel was found to be equally efficacious as curenext gel when used as an adjunct to SRP in localized pockets.

Keywords: NIL

Introduction

Periodontitis is an inflammatory disease of the supporting tissues of teeth due to specific microorganisms gradually destroying the periodontal ligament and alveolar bone. Periodontitis is characterized by loss of attachment, increased periodontal pocket depth or recession, bleeding while probing, changes in bone height and density, mobility and tooth loss in advanced cases.[1] The periodontal pathogens identified at a high level in the periodontitis include *P. gingivalis, T. forsythia, P. intermedia, T. denticola* and *A. actinomycetemcomitans.* It is a multifactorial disease with other predisposing factors also involved, like Systemic, hormonal, environmental and genetic factors.[2]

Liquorice is a herb with a unique flavor derived from Glycyrrhiza glabra and has been used as a medicine for thousands of years. It has a familiar household name called mulethi. The licorice is a sweet, humid and soothing herb belonging to the species glycyrrhiza native to the Mediterranean and Asian countries. The term Glycyrrhiza derives from the ancient Greek words; glycos signifying sweet and rhiza signifying root.[2] The active chemical ingredients that confer the unique taste of licorice are

glycyrrhizi acid and its glucosid, called glycyrrhizin.[3] Liquorice is rich in secondary metabolites which have been associated with various health benefits. Auxiliary metabolites of liquorice roots have appeared to have a useful impact on the treatment of various illnesses such as cancer, tuberculosis, atherosclerosis, gastric ulcers and bacterial infections.[4]

Bioactive phytoconstituents of G. glabra cease the activity of osteoclasts that are responsible for alveolar bone destruction in periodontitis and promote the synthesis of osteoblasts for new bone formation. It also inhibits the growth of periodontopathogen and reduces the inflammatory markers at the site of infection.[2]

Materials & Method:

G. glabra powder was obtained (Organic Indore®). The dry powder of G. glabra was added to the ethanol: water (30:70) to gain extract of it. And the extract was filtered using filter paper. Then 2 grams of Carbopol were added to the 100 ml of phosphate buffer solution. After the G. glabra extract and preservatives were dissolved with each other. G. glabra solution was slowly added into the Carbopol solution. After that, the gelling agent (Na-CMC) was added slowly with continuous magneting stirring. And 10% of G. glabra gel was obtained.

A total of 18 systemically healthy patients with bilateral pocket probing depth ≥ 5mm, clinical attachment level ≥ 6mm and Gingival index score ≥ 1 were included in the study. Smokers, pregnant or lactating women and patients under systemic or topical antibiotic treatments in the past 6 months were excluded from the study. For standardization purpose, an acrylic stent was fabricated to check the Pocket probing depth and Clinical attachment level at each visit.

36 sites were randomly divided into two groups: Test Group (G. glabra) and Control Group (Curcumin Gel). The gel was placed with the help of a blunt syringe into the periodontal pocket in both test and control groups. All the clinical parameters, Gingival index (GI), Pocket probing depth (PPD) and Clinical attachment level (CAL) were recorded at the baseline before Scaling and root planing (SRP) and at 1 month of re-evaluation.

Statistical Analysis:

For intergroup comparison and intragroup comparison, paired t-test and unpaired t-test were

used respectively to compare the pre-and post-intervention scores.

Result:

In the present study total of 36 sites were evaluated at the baseline and 1 month. All the clinical parameters were recorded by a single examiner at the baseline (before SRP) and 1 month.

On intragroup comparison, there was a statistically significant difference found in GI, PPD and gain in CAL at baseline to 1 month, both for the test and control groups. On intergroup comparison, the test group showed a better reduction in GI, PPD and gain in CAL than control group, though not statistically significant.

Discussion:

Liquorice has been labeled Generally Recognized as Safe (GRAS) by the United States Food and Drug Administration (FDA) and has been considered secure for human utilization provided, it is expended in little amounts and by people who are not delicate to glycyrrhizin.[5] It is demonstrated that intemperate liquorice admissions can lead to hypokalemia, hypertension, rhabdomyolysis, muscle loss of motion, respiratory impedance, hypertensive crises, hyperparathyroidism, encephalopathy and intense renal diseases.[6] Touyz LZ et al suggested that 250-500 mg of liquorice can be securely consumed up to three times a day for therapeutic purposes.[7]

The present clinical trial was planned to verify the efficacy of G. glabra gel on periodontitis patients. G. glabra shows a good result without any complications. G. glabra improves the periodontal status due to its antibacterial and antioxidant properties. G. glabra is used in homegrown preparations as a viable cure for sore throat and respiratory infections. It is cheaper and effortlessly available.[8] The present clinical trial showed a significant reduction in all clinical parameters for both the groups, but G. glabra gel showed better results when compared to curenext® gel, though not statistically significant.

Various clinical trials pointing to discovering common assets for the treatment of periodontitis have looked into the phytochemicals of Liquorice to treat

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periodontitis. Rakshanaa TV and Lakshmi T[9] reported a study to check the adequacy of Ocimum sanctum and G. glabra mouthwash against chlorhexidine mouthwash and found both were equally viable against oral pathogens in vitro. Bodet C et al[10] examined the reaction of liquorice on periodontopathogen-induced inflammatory reaction and found that liquorice extract showed powerful anti-inflammatory properties by repressing the periodontopathogen LPS-induced IL-1beta, IL-6, and IL-8 and TNF-α reactions of macrophages. According to La VD et al[11] licoricidin and licorisoflavan A effectively inhibit inflammatory cytokines and matrix metalloproteinases (MMPs) and can be used for the treatment of cytokine and/or MMP-mediated clutters such as periodontitis.

Farhad SZ et al[12] and Moteshakker M et al[13] conducted a randomized triple-blind placebo-controlled clinical trial on periodontitis patients using G. glabra capsule in a dose of 400 mg/day. Doxycycline capsule was used as a positive control and placebo capsules were utilized as a negative control. Both doxycycline capsules and G. glabra capsules were successful in improving the periodontal status. A randomized clinical trial was conducted by Madan S et al[8] to check the efficacy of 10% of G. glabra gum paint in chronic periodontitis and a significantly better result was observed. Moreover Jain P et al[14] developed 10% G. glabra mouthwash and in the clinical trial, there was an improvement in periodontal status but not measurably significant. Hassan KA and Khalil S[15] utilized G. glabra mouthwash on patients with oral stomatitis. There was a remarkable enhancement in the condition of patients. The results of the present clinical trial is accordance with all the above studies.

Conclusion:

Hence, G. glabra can be used successfully as an alternative for a commercially accessible agent. It can be used in long duration due to minimal or no other complications for prevention and effective treatment of periodontitis. Furthermore, clinical and microbiological studies should be conducted based on therapeutic plants in the treatment or prevention of periodontal diseases so that patients can afford cheaper and more successful treatment strategies for the management of periodontitis.

References:

1. Newman MG, Takei H, Carranza FA. Carranza's classification and epidemiology of periodontal diseases. In: Carranza's Clinical Periodontology. 10th ed. Philadelphia: WB Saunders Company; 2007. p. 100-31.
2. Messier C, Epifano F, Genovese S, Grenier D. Licorice and its potential beneficial effects in common oro-dental diseases. Oral Dis 2012;18(1):32e9.
3. Olukoga A, Donaldson D. Liquorice and its health implications. J R Soc Promot Health. 2000;120(2):83-9.
4. Isbrucker RA, Burdock GA. Risk and safety assessment on the consumption of Licorice root (Glycyrrhiza sp.), its extract and powder as a food ingredient, with emphasis on the pharmacology and toxicology of glycyrrhizin. Regul Toxicol Pharmacol. 2006;46(3): 167-92.
5. Peters MC, Tallman JA, Braun TM, Jacobson JJ. Clinical reduction of S. mutans in pre-school children using a novel liquorice root extract lollipop: a pilot study. Eur Arch Paediatr Dent 2010;11(6):274e8.
6. Yasue H, Itoh T, Mizuno Y. Severe hypokalemia, rhabdomyolysis, muscle paralysis, and respiratory impairment in a hypertensive patient taking herbal medicines containing licorice. Intern Med 2007;46(9):575e8.
7. Touyz LZ. Liquorice health check, Oro-dental implications, and a case report. Case Rep Med. 2009;2009:1-6.
8. Madan S, Kashyap S and Mathur G. Glycyrrhiza glabra: An efficient medicinal plant for control of periodontitis–A randomized clinical trial. J Int Clin Dent Res Organ. 2019; 11: 32-5.
9. Rakshanaa TV, Lakshmi T. Antibacterial efficacy of herbal mouthwash against oral microbes – In vitro assay. J Adv Pharm Educ Res 2017;7:31-3.
10. Bodet C, La VD, Gafner S, Bergeron C, Grenier D. A licorice extract reduces lipopolysaccharide-induced proinflammatory cytokine secretion by macrophages and whole blood. Periodontol 2008;79:1752e61.

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11. La VD, Tanabe S, Bergeron C, Gafner S, Grenier D. Modulation of matrix metalloproteinase and cytokine production by licorice isolates licoricidin and licorisoflavan A: potential therapeutic approach for periodontitis. J Periodontol 2011;82:122e8.

12. Farhad SZ, Aminzadeh A, Mafi M, Barekatain M, Naghney M, Ghafari MR. The effect of adjunctive low-dose doxycycline and licorice therapy on gingival crevicular fluid matrix metalloproteinase-8 levels in chronic periodontitis. Dent Res J 2013;10:624-9.

13. Moteshakker M, Raifiei E, Farhad Z, Aminzadeh A. Comparison of the effect of doxycycline and licorice on chronic periodontitis – A clinical trial study. J Res Dent Sci 2014;11:123-9.

14. Jain P, Sontakke P, Walia S, Yadav P, Biswas G, Kaur D. Assessment of the efficacy of licorice versus 0.2% Chlorhexidine oral rinse on plaque-induced gingivitis: A randomized clinical trial. Indian J Oral Heal Res 2017;3:15-8.

15. Hassan KA, Khalil S. Liquorice mouth wash as treatment for mouth ulcer. Int J Adv Pharm Sci 2013;4:916-21

Table 1. Intragroup comparison of the Test group

PARAMETERS	TIME INTERVALS	MEAN±SD	MEAN DIFFERENCE	p VALUE
Gingival index	Baseline	2.11±0.47	1.06	<0.001*
	1 month	1.06±0.24		
Pocket depth	Baseline	5.56±0.4	2.12	<0.001*
	1 month	3.44±0.50		
CAL	Baseline	7.06±0.64	1.84	<0.001*
	1 month	5.22±0.65		

SD- Standard deviation, *-Significant, p value- 0.001

Table 2. Intragroup comparison of the Control group

PARAMETERS	TIME INTERVALS	MEAN±SD	MEAN DIFFERENCE	p VALUE
Gingival index	Baseline	2.11±0.32	1	<0.001*
	1 month	1.11±0.32		
Pocket depth	Baseline	5.22±0.43	1.66	<0.001*
	1 month	3.56±0.51		
CAL	Baseline	6.78±0.73	1.28	<0.001*
	1 month	5.50±0.61		

SD- Standard deviation, *-Significant, p value- 0.001

Table 3. Intergroup comparison of the test group and control group

PARAMETERS	GROUPS	Intervals	MEAN±SD	MEAN	p VALUE

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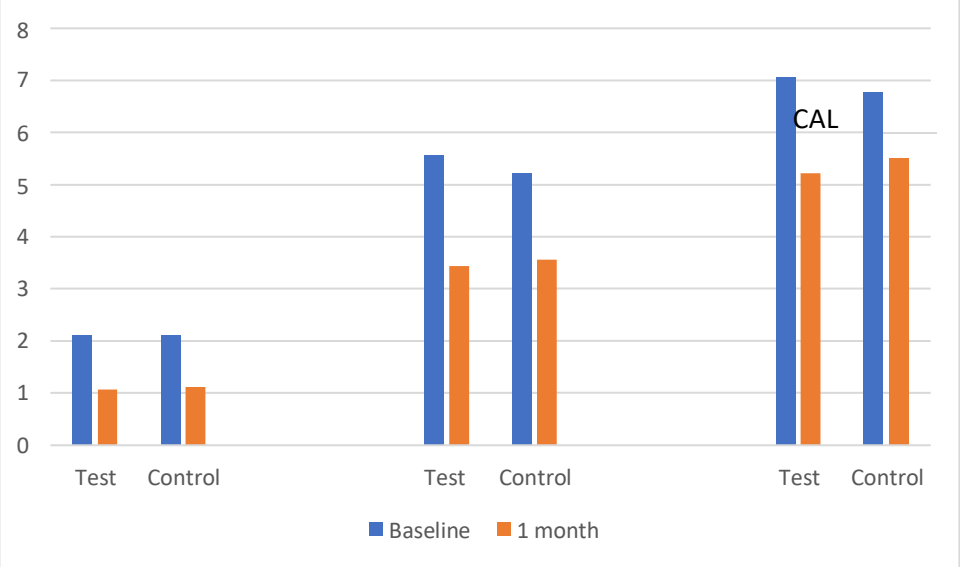
				DIFFERENCE	
Gingival index	Test	Baseline	2.11±0.47	1.06	p = 0.56 NS
		1 month	1.06±0.24		
	Control	Baseline	2.11±0.32	1	
		1 month	1.11±0.32		
Pocket probing depth	Test	Baseline	5.56± 0.4	2.12	p = 0.52 NS
		1 month	3.44±0.50		
	Control	Baseline	5.22±0.43	1.66	
		1 month	3.56±0.51		
CAL	Test	Baseline	7.06±0.64	1.84	p = 0.16 NS
		1 month	5.22±0.65		
	Control	Baseline	6.78±0.73	1.28	
		1 month	5.50±0.61		

SD- Standard deviation, NS – Nonsignificant, *-Significant, p value- 0.001

GRAPH 1: Intragroup Comparision of Test group and Control group



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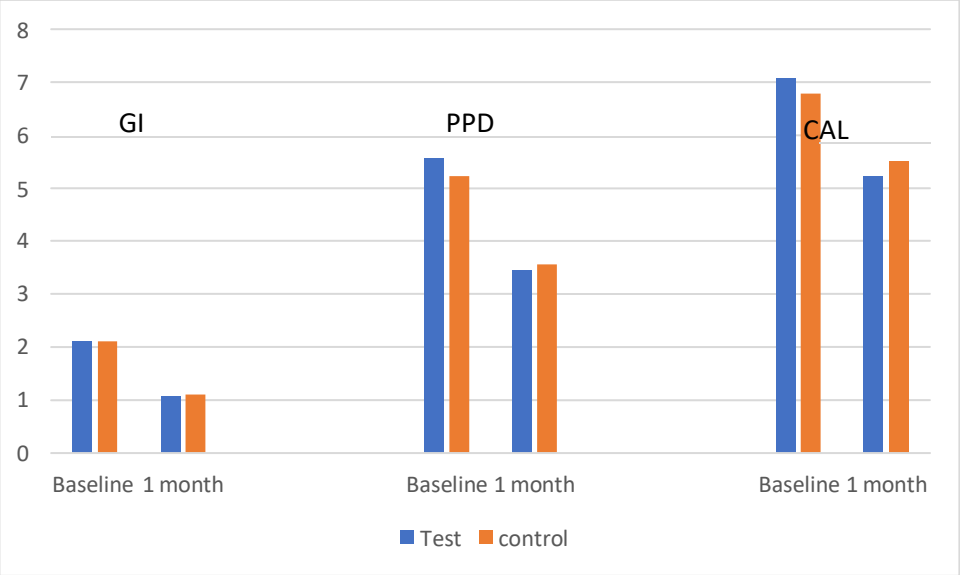
GRAPH 2: Intergroup Comparision at Baseline and 1 month



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