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Effect of Curcumin Gel in The Treatment of Periodontal Disease: A Clinical Trial.

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ABSTRACT

To assess the efficacy of curcumin gel in the treatment of periodontal disease. The curcumin gel reduces microbes and improves the efficacy in the treatment of periodontal diseases. Complete removal of irritants is not possible with mechanical therapy alone. Mechanical therapy when combined with local delivery systems such as the curcumin gel reduces microbes and improves clinical parameters. Curcumin a constituent of *Curcuma longa* plant, which possess antioxidant, anti-inflammatory, anti-carcinogenic, anti-microbial, anti-hyper and hypo cholesterolemic properties Curcumin gel is given for the treatment of periodontal diseases. This study shows that the curcumin gel which is used as an adjunct showed better results due to its anti inflammatory properties. Curcumin gel can be used an adjunct to local drug delivery agent. However, further studies on large population using varied concentrations of drug may be required to improve the substantivity of the drug.

Keywords: Curcumin, scaling, periodontal diseases, anti inflammatory action, curcuma longa, anti microbial action, antioxidant.

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INTRODUCTION

Periodontitis is one of the most common diseases affecting the teeth. It is seen in individuals who are more susceptible to the disease [1]. Periodontal diseases are infectious and inflammatory conditions. Thus, deep pockets require adjunctive antimicrobial regimen to aid in the mechanical debridement of tooth surfaces by local and systemic drug delivery of chemical agents [1]. The ultimate goal of periodontal therapy is to cure inflamed tissue, eliminate the diseased pockets and reduce the number of pathogenic bacteria. Various treatment modalities include mechanical therapy, chemotherapy and systemic administration of antibiotics.

Conventional therapy includes scaling, root planning, and curettage. Complete removal of irritants is not possible with mechanical therapy alone. Local drug delivery (LDD) systems have been proposed for the treatment of periodontitis [1-2]. Curcumin is used in the treatment of periodontal diseases.

CURCUMIN:

Turmeric (*Curcuma longa*) which is extensively used as a spice, food preservative, coloring material, and household remedy is emerging as an alternative treatment option for periodontal diseases. Curcumin (diferuloylmethane), the main yellow bioactive component of turmeric has wide spectrum of biological activity including anti-inflammatory, antioxidant, anticarcinogenic, antimutagenic, anticoagulant, antifertility, antidiabetic, antibacterial, antifungal, antiprotozoal, antiviral, antifibrotic, antivenom, antiulcer, hypotensive, and hypocholesteremic activities [2-3]. Herbal plants are used as an alternative to systemic agents. Polyphenols are a group of phytochemicals that are rich sources for anti-oxidants. Among polyphenols, the most widely used substance is Turmeric, a rhizome of *Curcuma longa*, found to be distributed in tropical and subtropical regions of the world mainly as a spice. It is popularly called Haldi in India and named as a curry spice by British [4]. The rhizomes contain curcuminoids, curcumin, demethoxy curcumin, bis demethoxy curcumin, 5'-methoxycurcumin and dihydrocurcumin, which are found to be natural antioxidants.

MATERIALS AND METHOD

This study was conducted among 13 individuals having periodontal problems. The subjects were randomly screened and taken into consideration. Curcumin gel with 10mg of curcuma longa is used for treating the patients. The patients with periodontal problems were assessed and their gingival index, probing depth and clinical attachment loss were noted. The manual treatment option scaling was done for every patient, followed by that the curcumin gel of 10mg is given and is applied for 7 days regularly. Then again after the interval of 7 days the gingival index, probing depth and clinical attachment loss were calculated.

RESULT

The obtained data's were analysed statistically. The p values for each index were noted and then it was discussed.

Table 1: Before Scaling and Before Applying Curcumin

SERIAL NO	GINGIVAL INDEX	PROBING DEPTH	CLINICAL ATTACHMENT LOSS
1	0.1	3.5	2.4
2	0.3	1.5	1.8
3	0.2	2.8	2.2
4	0.4	3.8	1.6
5	0.13	2.5	2.3
6	0.33	2.2	1.8
7	0.1	1.6	2.1
8	0.3	2.3	2.4
9	0.2	2.7	2.5
10	0.14	3.2	2.2
11	0.2	2.6	1.7
12	0.3	1.8	2
13	0.2	2.4	2.7

	0.2230	2.5307	2.1307
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Table 2: After Scaling and Applying Curcumin

SERIAL NO	GINGIVAL INDEX	PROBING DEPTH	CLINICAL ATTACHMENT LOSS
1	0.09	3.3	2.1
2	0.12	1.28	0.3
3	0.17	2.62	1.8
4	0.31	2.7	1.4
5	0.1	2.32	2.12
6	0.2	2.13	1.62
7	0.08	1.4	1.83
8	0.1	2.12	2.2
9	0.2	2.42	2.22
10	0.1	3.1	2.1
11	0.16	2.4	1.52
12	0.22	1.62	1.9
13	0.2	2.2	2.43
	0.1576	2.2776	1.8107

Table 3: P Value for Gingival Index

	GINGIVAL INDEX	P VALUE
BEFORE APPLYING CURCUMIN	0.22	0.002
AFTER APPLYING CURCUMIN	0.15	

This result is significant that the p value is <0.5

Table 4: P Value for Probing Depth

	PROBING DEPTH	P VALUE
BEFORE APPLYING CURCUMIN	2.53	0.006
AFTER APPLYING CURCUMIN	2.2	

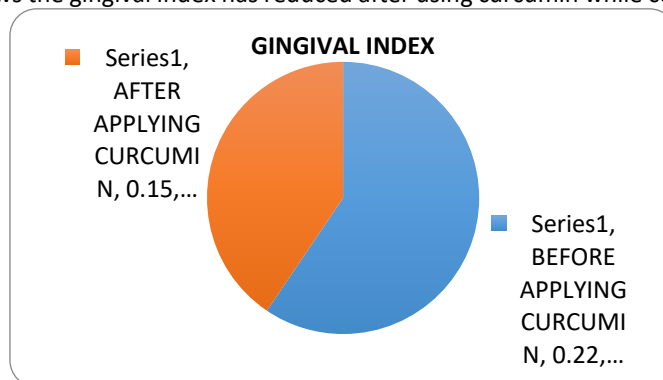
This result is significant that the p value is <0.5

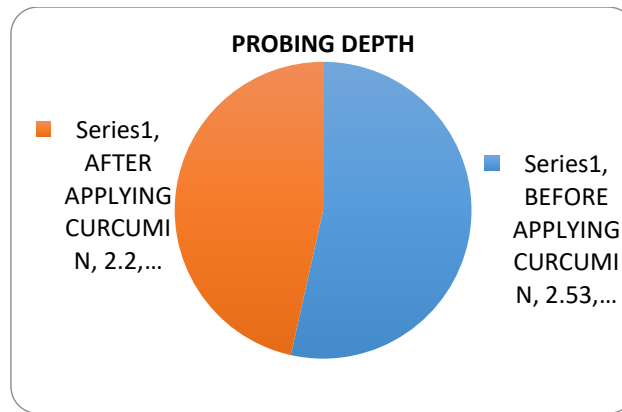
Table 5: P Value for Clinical Attachment Loss

	CLINICAL ATTACHMENT LOSS	P VALUE
BEFORE APPLYING CURCUMIN	2.1	0.01
AFTER APPLYING CURCUMIN	1.8	

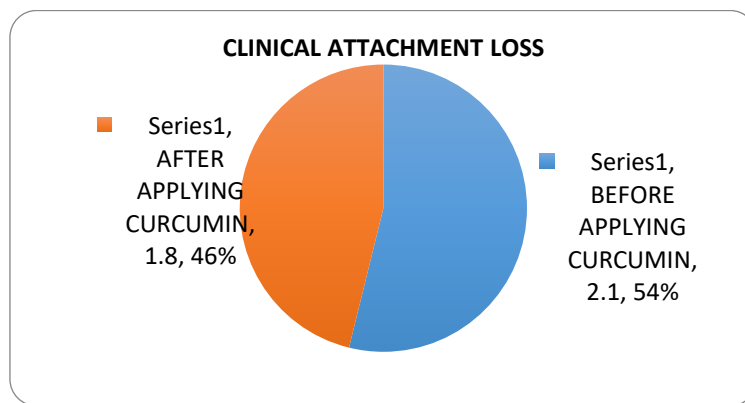
This result is significant that the p value is <0.5

This graph shows the gingival index has reduced after using curcumin while compared to the prior state





This graph shows that the probing depth has reduced after using curcumin. Before scaling and before applying curcumin the probing depth was 53% and after applying curcumin it reduced to 47%



This graph shows that the clinical attachment loss before applying curcumin was 54% and it has reduced to 46% after scaling and after applying curcumin.

DISCUSSION

Periodontitis is one of the most common diseases affecting the teeth. The ultimate goal of periodontal therapy is to cure inflamed tissue, eliminate the diseased pockets and reduce the number of pathogenic bacteria. Various treatment modalities include mechanical therapy, chemotherapy and systemic administration of antibiotics. Conventional therapy includes scaling, root planning, and curettage. Complete removal of irritants is not possible with mechanical therapy alone. Local drug delivery (LDD) systems have been proposed for the treatment of periodontitis. Curcumin is used as an adjunct in the treatment of periodontal diseases [7].

This result shows that the gingival index has reduced after scaling and after applying curcumin due to its anti-inflammatory and wound healing properties [8]. It reduces the inflammatory mediators produced by the arachidonic acid pathway and causes shrinkage by reducing inflammatory oedema and vascular engorgement of connective tissue [5-6]. In this study the p value of the gingival index is 0.002, the result is significant because the p value is <0.5

It promotes migration of various cell including fibroblasts in the wound bed and reduce vascularization by fibrosis of the connective tissue. It also promotes migration of epithelial cells by localization of TGF-β1 which causes re-epithelisation of tissues. It causes reduction in the probing depth to a considerable extent [4-5]. In this study the p value of the probing depth is 0.006, the result is significant because the p value is <0.5. This study also shows reduction in the clinical attachment loss. In this the p value of clinical attachment loss is 0.01, the result is significant because the p value is <0.5

The bar graph shows that the probing depth before scaling and before using curcumin was 53% and it has reduced to 47% after scaling and after using curcumin. The gingival index before scaling and before using

curcumin was 59% and it has reduced to 41% after scaling and after using curcumin. The clinical attachment loss before scaling and before using curcumin was 54% and it has reduced to 46% after scaling and after using curcumin. This shows that curcumin was useful as an adjunct in the treatment of periodontal diseases.

CONCLUSION

This study shows that the curcumin gel which is used as an adjunct showed better results due to its anti-inflammatory properties. Curcumin gel can be used as an adjunct to local drug delivery agent. However, further studies on large population using varied concentrations of drug may be required to improve the substantivity of the drug.

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