

Comparative Evaluation Of Herbal Extract - Wheat Grass Powder With Conventional Irrigating Solution - An In vitro Study

Research Article

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Abstract

Aim & Objectives: The aim and objective of this study is to compare the efficiency of wheat grass powder extract with conventional irrigating solution.

Background: The success of endodontic treatment depends on the eradication of microbes (if present) from the root-canal system and prevention of reinfection. The root canal is shaped with hand and rotary instruments under constant irrigation to remove the inflamed and necrotic tissue, microbes/biofilms, and other debris from the root-canal space. The main goal of instrumentation is to facilitate effective irrigation, disinfection, and filling. Irrigation is carried out to reduce the number of bacteria in the root canal system and to control the Periapical disease. A wide variety of synthetic agents have been used as irrigants. Because of the increased antibiotic resistance to these anti microbial agents, toxic and side effects, there is need for herbal alternatives which are non toxic and effective. Herbal alternatives are popular mainly due to their easy availability, cost and effectiveness, increased shelf life, low toxicity, anti-inflammatory and anti-oxidant properties.

Reason: This study was done to eradicate the side effects of synthetic agents used as irrigants and replaced by herbal alternatives.

Keywords: Wheat Grass; Sodium Hypochlorite; Irrigants.

Introduction

The effectiveness of endodontic files, rotary instrumentation, irrigating solutions, and chelating agents to clean, shape and disinfect root canals underpins the success, longevity, and reliability of modern endodontic treatments [1]. Enterococcus faecalis is the commonly found microorganism in failed/infected root canals of both primary and permanent teeth. Irrigation is carried out to reduce the number of bacteria in the root canal system and to control the Periapical disease. It has been found that natural plant extracts could be used as effective endodontic irrigants [2].

Wheat grass is a food prepared from the cotyledons of the common wheat plant, *Triticum aestivum* (subspecies of the fam-

ily Poaceae). Wheatgrass is a source of potassium, dietary fiber, vitamin A, vitamin C, vitamin E (alpha tocopherol), vitamin K, thiamin, riboflavin, niacin, vitamin B6, pantothenic acid, iron, zinc, copper, manganese, and selenium [3]. Wheatgrass is also a source of protein (less than one gram per 28 grams). Proponents of wheatgrass make many claims for its health properties, ranging from promotion of general well-being to cancer prevention [4]. However, according to the American Cancer Society, "available scientific evidence does not support the idea that wheatgrass or the wheatgrass diet can cure or prevent disease". Wheat grass is believed to have many unexplained natural healing qualities. Many of the phytonutrients (plant nutrients) contained in cereal grasses have yet to be identified and it is not completely known how they provide such great benefits to our health [5]. Wheat Grass is one

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of the most alkaline green leafy vegetables known and part of the cereal grass family, which includes barley grass, oat grass and rye grass.

There are very few studies on herbal extract medicines hence the aim of the study is to compare the efficacy of herbal extract-wheatgrass with conventional irrigating solution.

Materials And Methods

Thirty freshly extracted, intact, human permanent single rooted teeth with similar anatomic characteristics were selected. All soft tissues and debris on the teeth were removed using ultrasonic scaler and the teeth were stored in saline at room temperature. The teeth were randomly divided into three experimental groups of 10 teeth each and subjected to the following procedures. Standard endodontic access cavities were prepared with round or straight fissure burs. The root canals instrumented to a size 40 file and in between different irrigating solutions were used for each experimental groups. Thirty samples were categorized into three groups with 10 samples in each: Group I: sodium hypochlorite, Group II: wheat grass extract, Group III: control group. After cleaning and shaping, Gates glidden were used to collect the dentin shaving samples from each experimental group.

The bacterial *E. faecalis* (ATCC) culture was grown overnight in broth and inoculated in Muller-Hinton agar plates (Figure 1 & Figure 2). The colony count were recorded and statistically as-

sessed using Mann Whitney U test. SPSS version 22.0 is used to analyse the data. Significance level is fixed as 5% ($\alpha = 0.05$).

Result

(If P-Value is <0.05 then statistically significant)

The Normality tests Kolmogorov-Smirnov and Shapiro-Wilks tests results reveal that the variable (Values) does NOT follow Normal distribution. Therefore, to analyze the data non-parametric method is applied. To compare the values between groups Mann Whitney U test is applied.

SPSS version 22.0 is used to analyze the data. Significance level is fixed as 5% ($\alpha = 0.05$) (Table 1, Table 2 & Figure 3).

Discussion

Triticum aestivum commonly known as wheatgrass. Wheatgrass is one of the best source of living chlorophyll which place an important in prevention of cancer. Wheatgrass is believed to have unexplained natural healing qualities because it is one of the most alkaline green leafy vegetables and a part of cereal grass family. Wheatgrass is also rich in many amino acids like lysin, tryptophan and phenylalanine [6, 7].

Sodium hypochlorite is an oxidising and hydrolysing agent [8, 9]. It is widely used root canal Irrigant. It is bactericidal and proteo-

Figure 1. Colony forming plates.

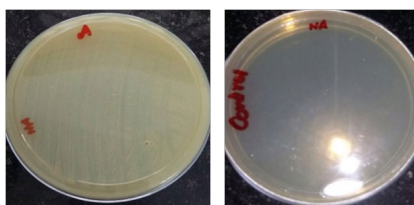


Figure 2. E. Faecalis culture grown in Muller-Hinton agar.



Figure 3. Box plot chart reveals that control group(sodium hypochlorite) showed significant difference in *E. faecalis* reduction than wheatgrass powder.

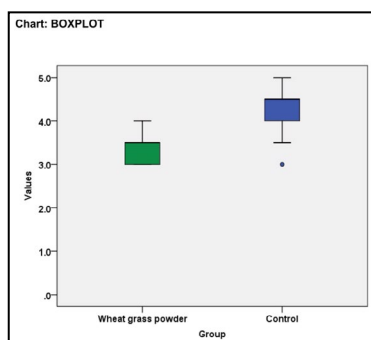


Table 1. Shows that sodium hypochlorite as control group showed a significant difference in first and third quartile when compared to wheat grass powder.

		Group		
		Wheat grass powder	Control	Total
Value s	Count	10	10	20
	Mean	3.5	4.3	3.9
	Std. Dev	0.4	0.6	0.7
	Median	3.5	4.5	3.8
	1st Quartile	3.0	4.0	3.5
	3rd Quartile	3.5	4.5	4.5

Table 2. Showed significant reduction in microbial count when sodium hypochlorite has been used. Wheat grass also showed reduction in microbial count than saline but not par with sodium hypochlorite.

	Group	N	Mean Rank	Z-Value	P-Value
Value s	Control	10	6.90	2.796	0.005
	wheat grass powder	10	14.10		

lytic but there are various disadvantage in sodium hypochlorite because of its high toxicity leads to living tissue damage except keratinised epithelia [10, 11]. It is strongly alkaline hypertonic extremely corrosive to metal and has very unpleasant taste.

In this study the anti-microbial reduction was much more with wheatgrass as compared with saline and much less with wheatgrass when compared with sodium hypochlorite [12, 13].

Sodium hypochlorite is an oxidising and hydrolysing agent. It has both bactericidal action and proteolytic action [14]. The main disadvantage with sodium hypochlorite is tissue toxicity and damages all living tissues except keratinised epithelia. It also has other disadvantage such as unpleasant odour and taste, strongly alkaline, hypertonic and it corrodes metal, but still sodium hypochlorite acts as a universal irrigant because of its tissue dissolving property and bactericidal action [15, 16].

In this present study, in order to overcome the disadvantage of sodium hypochlorite, wheat grass extract has been tried as an irrigating solution. Results showed that wheatgrass has good anti microbial efficacy against *E. faecalis* but not potent bactericidal than sodium hypochlorite. Future studies should concentrate on biocompatibility, tissue dissolving property and pH of wheatgrass extract. Furthermore, much research had been carried out in this regard [17-31].

Conclusion

Within the basis of this study and on the basis of results obtained we conclude that sodium hypochlorite remains the gold standard irrigating solution but wheat grass can be used as a better alternative in sodium hypochlorite allergic cases.

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