The effect of mucoadhesive gel containing satureja hortensis extract of 1% on severity of chemotherapy-induced mucositis pain in children: A double-blind clinical trial study

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Background and objective:

- Mucositis is one of the common complications of chemotherapy, and one of its symptoms is severe pain.
- The mucositis management is initiated by assessment of oral hygiene, as well as by changes of diet and management of pain.
- Many uses have been mentioned for satureja hortensis in traditional medicine.
- The present study was carried out with the aim of determining the effect of satureja hortensis extract mucoadhesive gel of 1% on severity of mucositis-induced pain in children under chemotherapy.

Satureja Hortensis (summer savoy)

- Satureja is a genus of aromatic plants of the family Lamiaceae, related to rosemary and thyme. It is native to North Africa, southern and southeastern Europe, the Middle East, and Central Asia.
- In Azerbaijan, savory is often incorporated as a flavoring in black tea.



- Summer savory with the scientific name of Satureja hortensis is an annual, gramineous semi-woody plant.
- It is one of higher flowering plants and dicotyledons often spread in Mediterranean areas.
- The ingredients of Satureja hortensis include materials such as Carvacrol, Thymol, Beta-Pinene, Paracemenu, Lemothen, Camphene, minerals, and vitamins.
- Carvacrol has antimicrobial, analgesic, anti-inflammatory and antioxidant effects.



[■]Abbasloo E, Dehghan F, Khaksari M, Najafipour H, Vahidi R, Dabiri S, et al. The anti-inflammatory properties of Satureja khuzistanica Jamzad essential oil attenuate the effects of traumatic brain injuries in rats. Scientific reports. 2016;6: DOI: 10.1038/srep33769.

[■]Sharifzadeh A, Khosravi AR, Ahmadian S. Chemical composition and antifungal activity of Satureja hortensis L. essentiall oil against planktonic and biofilmgrowth of Candida albicans isolates frombuccal lesions of HIV+ individuals. Microbialpathogenesis. 2016;96:1-9.

[■]Moradian H, Bazargani A, Rafiee A,Nazarialam A. In vitro comparison ofantimicrobial activity of aqueous decoction of Coriandrum sativum, and Dentol Drop withchlorhexidine on Streptococcus mutans.Iranian journal of microbiology. 2013;5(3):239.

[■]Landa P, Kokoska L, Pribylova M, Vanek T, Marsik P. In vitro anti-inflammatoryactivity of carvacrol: Inhibitory effect on COX-2 catalyzed prostaglandin E 2biosynthesisb. Archives of pharmacal research.2009;32(1):75-8.

- In traditional medicine, this herb has therapeutic uses such as antispasmodic, anti-diarrhea, stimulation of reproduction and treatment of digestive disorders.
- Anti-bacterial, anti-inflammatory, anti-fungal and antioxidant properties have been also mentioned for Satureja hortensis.
- Considering the prevalence of mucositis in children under chemotherapy,

[■]Shahab A, Haghighati F, Baeeri M, Jamalifar H, Abdollahi M. A clinical, microbiological and immunological comparison between subgingival irrigation with Dentol and chlorhexidine in advanced periodontitis. Arch Med Sci. 2011;7(1):15460.

[■]Zolfagharian F, Razavi BM, Hosseinzadeh H. Anticonvulsant effect of Satureja hortensis aerial parts extracts in mice. Avicenna Journal of Phytomedicine. 2016;6(3):305.

[■]Vosough-Ghanbari S, Rahimi R, Kharabaf S, Zeinali S, Mohammadirad A, Amini S, et al. Effects of Satureja khuzestanica on serum glucose, lipids and markers of oxidative stress in patients with type 2 diabetes mellitus: a double-blind randomized controlled trial. Evidence-Based Complementary and Alternative Medicine. 2010;7(4):465-70.

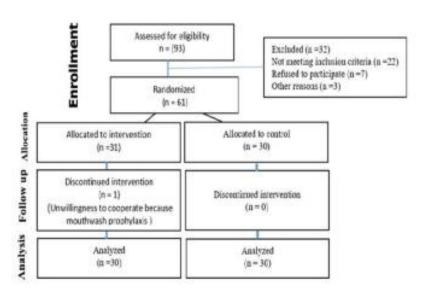
This study was carried out with the aim of determining the effect of Satureja hortensis extract 1% on severity of mucositis-induced pain and it's healing in children under chemotherapy.

Ethical issues, an approval with the number IR.TBZMED.REC.1395.282 was obtained from the ethics committee of Tabriz University of Medical Sciences.

The study was registered in Iranian Registry of Clinical Trial site with the number (IRCT- code) IRCT2016061813691N7.

Materials and method:

- This double—blind clinical trial study was carried out on 60 children who were affected by mucositis following chemotherapy at the Tabriz Children's Hospital from August to November, 2016.
- Tabriz Children's Hospital is pediatric education center is one the referee center in the North West of Iran.
- The samples were randomly assigned into two groups of intervention and control.
- The intervention group applied satureja hortensis extract gel of 1% and the control group applied the placebo gel twice daily for 5 days after the onset of mucositis along with routine treatment.



Consort diagram showed the flow of participants in the study

- Agricultural Satureja hortensis was used for preparing and extracting the cohesive gel.
- first completely cleaned and washed and then soaked in 70% hydro alcoholic solution and put on the shaker for 72 hours to extract the gel.
- Sodium carboxymethyl cellulose at a concentration of 4% was added to the solution and after stirring of the solution, it could stay at the same state until 24 hours to become fully hydrated.
- The whole obtained gel was passed from the threecylinder mill, filled in tubes of 40gr by a filling machine in aseptic conditions and packed by the machine.
- The placebo gel was also prepared from the materials used in preparation of Satureja hortensis extract gel, except for Satureja hortensis extract, and was packed in the tubes with the same shape and color.





		Intervention group	Control group		
Variables		Number (Percent)	Number (Percent)	P-value	
		n = 30	n = 30		
Gender	Female	12 (40.0)	8 (26.8)	0.273	
	Male	18 (60.0)	22 (73.3)		
Mother's education	Illiterate elementary	11 (36.7)	6 (20.7)		
	Intermediate high	13 (43.3)	20 (69.0)	0.139	
	school	13 (43.3)	20 (09.0)		
	University education	6 (20.0)	3 (10.3)		
Father's job	Employee	4 (13.8)	5 (16.7)	0.916	
	Self-employed	13 (44.8)	11 (36.7)		
	Worker	7 (26.1)	9 (30.0)		
	Other	5 (16.7)	6 (16.7)		
Diagnosis	ALL	12 (40.0)	17 (56.7)	0.409	
	Neuroblastoma	4 (13.3)	2 (6.7)		
	Connective tissue	7 (23.3)	3 (10.0)		
	sarcoma	7 (23.3)	3 (1030)		
	Other	2 (6.6)	3 (9.9)		
	Lymphoma	5 (16.7)	5 (16.7)		
Diet	Normal	15 (50.0)	19 (63.3)	0.297	
Diet	Low-salt	15 (50.0)	11 (36.7)	0.297	
Prophylaxis	Yes	4 (13.3)	2 (6.7)	0.389	
mouthwash	No	26 (86.7)	28 (93.3)	0.389	
Variables	prinhler Mean (SD) Mean (SD)			P-value	
		n = 30	n = 30		
Times of hospitalization (month)		14.0 ± 10.8	15.2 ± 9.9	-0.434	
Duration of chemotherapy (day)		4.6 ± 2.2	4.0 ± 1.6	1.11	
Absolute count of neutrophil *1000		1.5 ± 1.8	2.2 ± 1.6	-1.49	
Weight (kg)		25.5 ± 12.6	23.1 ± 10.5	0.814	

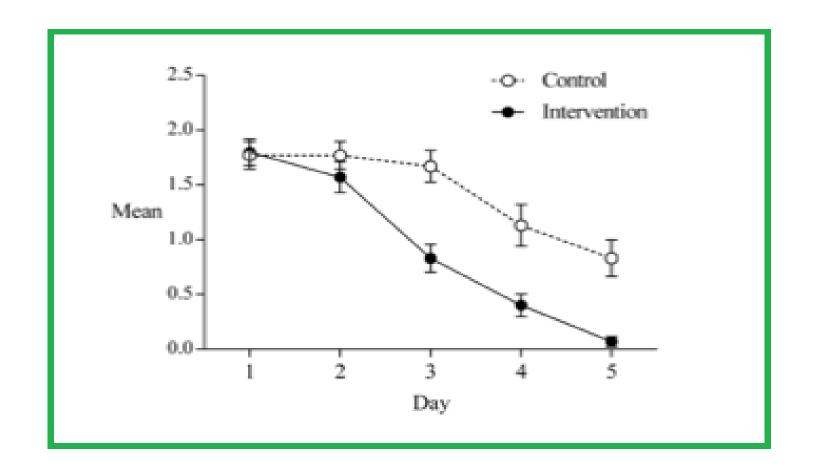
SD: Standard deviation; ALL: Acute lymphoblastic leukemia.

The demographic and clinical characteristics of the patients in the two groups of control and intervention

Time	Intervention group	Control group	Control group P- value*	
1 IIIIC	Mean (SD), n = 30	Mean (SD), n =30	r- value	
First day	3.5 ± 2.1	3.1 ± 1.8		
Second day	1.8 ± 1.4	2.5 ± 2.0	P<0.001	
Third day	0.2 ± 0.5	1.9 ± 1.6		
Fourth day	0.0 ± 0.0	1.1 ± 1.4		
Fifth day	0.0 ± 0.0	0.4 ± 1.0		

^{*:} Repeated measures ANOVA; SD: Standard deviation.

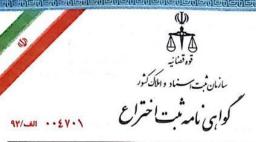
The comparison of the severity of mucositis-induced pain in 5 days between the two groups of intervention and control



The diagram of the severity mucositis pain in 5 day between two groups (intervention and control)

Conclusion:

- Based on the findings obtained from the present study, it seems that Satureja hortensis extract mucoadhesive gel of 1% can be effective in treatment of chemotherapy-induced mucositis pain.
- Especially that the preparation of this herb is less costly for the patient compared to the other chemical mouthwashes.
- One of limitation of this study is a small number of patients, and it is recommended that a study be conducted with a larger sample size and in several different treatment centers, as well as the individual and physiological characteristics of the patients as another limitation of the study.





اصغر محمدبوراصل (۵٪) . بوصف جوادزاده (۱۰٪) .محمد ارشدی بستان آباد (۳۰٪) .امیرعطااله هیرادفر (۲۰٪) .طاهره شمات ناک :الوندنزادمجارنشین (۶۰٪) .باقر خلوتی خلوت (۵٪)

مشخصات كامل مالكين ظهر گواهي ثبت . . .

ه ... اصغر محمد يوراصل يوسف جوادزاده محمد ارشدى بستان أباد امير عطااله هيرادفو طاهره الوندنزاده جارنشين بافر محمات تحر*م أخ*لوتي خلوت

مشخصات كامل مخترعين ظهر گواهي ثبت . . .

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نثره وتایخ افعاد نامد اصلی : خدت تابست: ۲۰ سال الاین نثرود کایخ ثبت افعاد نامد: نثوری ثبت اختراع:

نت عابت: ٢٠ سال ١٥ على على دوي يخب المعارضة: المدوي يخب المتران: ١٠ سال ١٠٠٠ من ١٠

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هدت حمايت اختراع 20 سال از تاريخ تسليم اظهارنامه هد باشد منوط به اينكه اقساط ساليانه اختراع در مواعد مقرر توسط متقاشس پرداخت شود

- 🐞 منام كواي نار: توميف ادما ، مظامه توميف و تنز
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Original Article (Pages: 7605-7614)

The Effect of Mucoadhesive Gel Containing Satureja Hortensis Extract 1% on Severity of Chemotherapy-Induced Mucositis Pain in Children: A Randomized Clinical Trial

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Abstract

Background: One of the symptoms of mucositis caused by chemotherapy is pain. Mucositis management is initiated by assessment of oral hygiene and management of pain. Many uses have been mentioned for Satureja hortensis in traditional medicine. The study was carried out with the aim of determining the effect of Satureja hortensis extract mucoadhesive gel of 1% on severity of mucositis-induced pain in children under chemotherapy.

Materials and Methods

This randomized parallel double-blind clinical trial was carried out on 60 children who were affected by mucositis following chemotherapy in 2016. The samples were randomly assigned into two groups of intervention and control. The intervention group applied Satureja hortensis extract gel of 1% and the control group applied the placebo gel twice daily for 5 days after the onset of mucositis along with routine treatment. Oral mucosa was evaluated daily. Also, the Oucher pain tools and a demographic checklist were used. The data was analyzed using SPSS version 13.0 software.

Results: The obtained data showed that the two groups had statistical difference in terms of the severity of the pain relief during the time, and pain severity reduced from 3.5 ± 2.1 to 0.0 ± 0.0 in intervention group and 3.1 ± 1.8 to 0.4 ± 1.0 in control group in fifth day (p <0.001).

Conclusion

The study showed that the extract 1% of Satureja hortensis is effective in healing mucositis induced pain and can be used as a new treatment method in relieving reducing mucositis pain.

Key Words: Children, Chemotherapy, Mucositis, Pain, Satureja hortensis.

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