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Effectiveness Of Topical Application Of Honey On Radiation Induced Mucositis In Patients Undergoing Radiation Therapy At Selected Hospital In Vadodara.

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Article History

Abstract:

Background: Most patients with oral cancer receive chemo radiotherapy with or without surgery for treatment and develop oral mucositis, a debilitating adverse. Currently, there is no standard regimen for the management of radiation-induced mucositis. This study aims to evaluate the effect of honey on radiation-induced mucositis.
Methods: Quasi experimental study of 50 cancer patient was undertaken in chosen areas and 25 patients were in experimental group and 25 patients were in control group. The data were obtained from patients via face-to-face interviews using a pretested questionnaire, and the data were analyzed using SPSS version 25.0 software.
Result: In experimental group the mean pretest assessment value was 1.2 and the standard deviation was 0.4 and in the control group the mean pretest assessment was 1.8 and the standard deviation was0.8. The p-value (0.0044) $p<0.05$ significant. That is honey application was effective to reducing the oral mucositis among patients undergoing radiation therapy in post-test. Demographic variables Age, Gender, food habits, smoking, alcohol, tobacco chewing, chewing battle leaves, education level and profession had shown no statistically significant association with the pretest grades of oral mucositis. $P<0.005$.
Conclusion: Natural honey can be an excellent treatment for radiation-induced oral mucositis. Honey may be a simple, potent, and inexpensive medication that is widely available, and it may be a more effective therapeutic agent in the treatment of radiation mucositis.

Key Word: Effectiveness, Honey, mucositis, Hospital

INTRODUCTION:

✧ Mouth cancer refers to cancer that develops in any of the parts that make up the mouth (oral cavity). Mouth cancer can occur on the: Lips, Gums, Tongue, Inner lining of the cheeks, Roof of the mouth and Floor of the mouth (under the tongue)[1].

- ✧ Cancer that occurs on the inside of the mouth is sometimes called oral cancer or oral cavity cancer. Mouth cancer is one of several types of cancers grouped in a category called head and neck cancers. Mouth cancer and other head and neck cancers are often treated similarly. Risk factors include tobacco use, heavy alcohol use and human papillomavirus (HPV) infection. Symptoms include a sore that doesn't heal, a lump or a white or red patch on the inside of the mouth. Treatment includes surgery and radiation therapy. In some cases, chemotherapy may be required [2].
- ✧ Radiotherapy (RT) is the use of ionising radiation to treat cancer and other disorders. Radiation harms both cancer and normal cells. Normal cells can mend themselves and operate normally. The majority of individuals with head and neck cancer benefit from radiation therapy. [3]
- ✧ Mucositis is a painful inflammation and ulceration of the mucous membranes lining the digestive tract that occurs as a side effect of cancer chemotherapy and radiotherapy. Mucositis can occur anywhere in the digestive tract, however oral mucositis refers to inflammation and ulcers in the mouth. Oral mucositis is a common and frequently debilitating side effect of cancer treatment.[4]
- ✧ Mucositis is now recognized as an epithelial and sub epithelial injury that progresses through five stages (initiation, first damage response, signal amplification, ulceration, and healing).[5]

Mucositis prevention is confined to reducing its severity through pain and discomfort management, oral health care programmes, and/or attempts to eradicate microbes suspected to be involved in the formation or promotion of radiation mucositis.[6] Honey is a byproduct of floral nectar and secretion of the honeybee's upper aero-digestive tract, which is subsequently concentrated inside the bee hive through a dehydration process. Honey has been used as a treatment since the time of Egyptian culture, but it has only recently acquired a position in modern medicine. Honey can limit bacterial development and improve healing due to its high viscosity, hygroscopic nature, rich nutritional characteristics, acidic PH, hydrogen peroxide, and high osmolarity.[7] Honey has also been used to treat burns, infected surgical wounds, post-surgical wound infections, and pressure ulcers. The purpose of this study is to assess the effects of natural honey and 0.15% benzydamine hydrochloride on the onset and severity of radiation mucositis.

MATERIAL AND METHODS:

- ❖ **Research area and duration:**

Research was conducted in the selected cancer hospital at Vadodara and one month

- ❖ **Research design:** Quasi experimental research design one group pretest and posttest research was conducted at cancer patient
- ❖ **Population**

Study population: All cancer patients currently available during data collection were the population source. All cancer patients currently available during data collection period made up the study population.

- ❖ **Inclusion Criteria**: Available during data collection
- ❖ **Exclusion Criteria:** Not interested for the study were excluded from the study.
- ❖ **Sample Size**

50 cancer patients were selected 25 experimental group and 25 control group.

- ❖ **Sampling technique:**

Convenience sampling technique were selected

RESULTS:

SECTION -I

Table: Demographic characteristics in Experimental Group and Control Group

Demographics	Experiment group (Frequency)	%	Control group (Frequency)	%
Age groups				
18-35	7	28	6	24
36-50	14	56	15	60
51-65	4	16	4	16
Gender				
Male	15	60	14	56
Female	10	40	11	44
Food habits				
Vegetarian	13	52	11	44
Non-vegetarian	12	48	14	56
Smoking				

No	12	48	13	52
Yes	13	52	12	48
Alcoholic				
No	8	32	12	48
Yes	17	68	13	52
Chewing tobacco				
No	14	56	13	52
Yes	11	44	12	48
Chewing the battle leaves				
No	18	72	19	76
Yes	7	28	6	24
Education				
Illiterate	15	60	14	56
Primary Education	10	40	11	44
Profession				
Working	16	64	13	52
Unemployed	9	36	12	48
Total	25	100.00	25	100.00

- ✧ Table 1.1 represents the distribution of patients with oral mucositis, according to age in Experimental group 14 (56%) were in the age group between 36-50 years, 7 (28%)were in the age group between 18-35 years, 4 (16%) were in the age group between 51-65 years . In control group 15(60%) were in the group between 36-50 years, 6 (24%)were in the age group between 18-35years, and 4(16%) were in the age group 51-65 years.
- ✧ With regards to gender of patients in Experimental group 15 (60%) were male and 10(40%) were female. In control group 14(56%) were male and 11(44%) were in the female.
- ✧ With regards to food habits of patients in Experimental group 13 (52%) were vegetarians and 12(48%) were non-vegetarians. In control group 14(57.69%) were non-vegetarians and 11(44%) were vegetarians.
- ✧ With regards to smoking habits of patients in Experimental group 13 (52%) were smoking and 12(48%) were no smoking. In control group 13(52%) were no smoking and 12(48%) were smoking.
- ✧ With regards to consumption of alcohol of patients in Experimental group 17 (65.38%) were yes consuming alcohol and 9(34.62%) were no alcohol. In control group 13(50%) were yes consuming alcohol and 13(50%) were no consuming alcohol.
- ✧ With regards to chewing of tobacco of patients in Experimental group 19(73.08%) were not chewing tobacco and 7(26.92%) were yes chewing tobacco. In control group 20(76.92%) were not chewing tobacco and 6(23.08%) were yes chewing tobacco.
- ✧ With regards to taking alcohol of patients in Experimental group 8(32%) were not taking alcohol and 17(68%) were yes taking alcohol. In control group 13(52%) were taking alcohol and 12(48%) were not taking alcohol.
- ✧ With regards to chewing of battle leaves of patients in Experimental group 18(72%) were not chewing battle leaves and 7(28%) were yes chewing battle leaves. In control group 6(24%) were chewing battle leaves and 19(76%) were not chewing battle leaves.
- ✧ With regards to educational status of patients in Experimental group 15(60%) were no formal education and 10(40%) were primary education. In control group 14(56%) were no formal education and 11(44%) were primary education.
- ✧ With regards to profession of patients in Experimental group 16(64%) were working and 9 (36%) were unemployed. In control group 13(52%) were working and12 (48%) were unemployed.

Table:2 Comparison of experiment group and control group with pre-test grades of Oral mucositis

Pretest grades	Experiment group	%	Control group	%	Total	%	Chi-square	p-value
Grade 1	8	30.77	11	42.31	19	36.54	1.0420	0.6450
Grade 2	9	34.62	9	34.62	18	34.62		
Grade 3	8	30.77	5	20	13	28.85		
Total	25	100.00	25	100.00	50	100.00		

- ✧ The table 2 shows the results of both groups Experimental Group: In the pre-test Oral mucositis,8(30.77%) of the patients had grade 3 and grade 2 and in Control Group :In the pretest,11(42.31%) were patients had grade 1,9(34.62%) were had grade 2 and 5(20%) were had grade 3.

Table: 3 Comparison of experiment group and control group with pretest and post-test grades of Oral mucositis by independent t test

Treatment	Groups	Mean	SD	SE	t-value	P-value	Significant.
Pretest	Experiment group	2.0	0.8	0.2	1.0242	0.3107	NS
	Control group	1.8	0.8	0.2			
Post-test	Experiment group	1.2	0.4	0.1	-2.9794	0.0044*	S
	Control group	1.8	0.8	0.2			

*p<0.05

The table 3 shows the results represents, the mean score on level of oral mucositis among patients undergoing radiation therapy with or without chemotherapy in experimental group the mean pretest assessment value was 2.0 and the standard deviation was 0.8 and in the control group the mean pretest assessment was 1.8 and the standard deviation was0.8. The p-value 0.3107 no significant. In experimental group the mean pretest assessment value was 1.2 and the standard deviation was 0.4 and in the control group the mean pretest assessment was 1.8 and the standard deviation was0.8. The p-value (0.0044) *p<0.05 significant. That is honey application was effective to reducing the oral mucositis among patients undergoing radiation therapy in post-test.

Table: Association between pretest grades of oral mucositis and demographic characteristics in experimental group

Demographics	**Pretest grades of oral mucositis**							**Chi-square**	**p-value**
	Grade 1	**%**	**Grade 2**	**%**	**Grade 3**	**%**	**Total**		
Age groups									
18-35	4	16	1	4	2	8	7	2.1160	0.3900
36-50	3	12	7	28	5	20	15		
51-65	1	4	0	0.00	2	8	3		
Gender									
Male	5	20	5	20	5	20	15	0.2390	0.3870
Female	3	12	3	12	4	16	10		
Food habits									
Vegetarian	4	16	5	20	3	12	12	2.130	0.3680
Non-vegetarian	4	16	3	12	6	24	13		
Smoking									
No	3	12	4	16	5	20	12	0.7220	0.6970
Yes	5	20	4	16	4	16	13		
Alcoholic									
No	3	12	2	8	4	16	9	1.0240	0.5990
Yes	5	20	7	28	4	16	16		
Chewing tobacco									
No	6	24	3	12	5	20	14	1.4670	0.1770
Yes	2	8	6	24	3	12	11		
Chewing the battle leaves									
No	7	28	6	24	5	20	18	2.3510	0.3090
Yes	1	4	2	8	4	16	7		
Education									
Illiterate	7	28	4	16	5	20	15	3.5250	0.1720
Primary Education	1	4	5	20	4	16	10		
Profession									
Working	4	16	6	24	5	20	15	0.6500	0.7230
Unemployed	4	16	3	12	3	12	10		
Total	8	25	9	36	9	32	25		

***p<0.005*indicates significant S-Significant NS-non significant**

The table 4 showed that demographic variables Age, Gender, food habits, smoking, alcohol, tobacco chewing, chewing battle leaves, education level and profession had shown no statistically significant association with the pretest grades of oral mucositis. P<0.005.

DISCUSSION:

➢ Radiation injury to the oral mucosa, tongue, salivary glands, mouth muscle, and alveolar bone causes oral problems from radiotherapy. Radiation mucositis is a side effect of radiotherapy for the treatment of cancers

of the head and neck. The oral mucosa normally has a reasonably high mitotic rate. Ionizing radiation causes mucosal erythematic, tiny whitish patches, and eventually confluent mucositis. Oral ulceration and bleeding become a dose-limiting complication in the latter phases. Mucositis is caused by an imbalance in cell death and division. New fractionation schedules, concurrent chemo-radiotherapy, and co-morbid medical disorders can all affect the severity of mucositis. Bacterial colonization of the oral mucosa can exacerbate and worsen pre-existing mucositis. Endotoxins produced by gram-negative bacteria are effective mediators of the inflammatory process in the oral mucosa. Radiation mucositis is also caused by oropharyngeal flora.[8]

- Other variables that can contribute to radiation-induced mucositis include poor oral hygiene and tobacco chewing and smoking practices. Several agents have been explored to treat radiation mucositis. Mucosal coating agents, anti-inflammatory agents, antimicrobials, subcutaneous or topical granulocyte macrophage colony stimulating factor, anesthetics and analgesics, and other agents that are difficult to classify are among the agents recommended or tested for the prevention and management of radiation mucositis. Most of these locally applied and systemically administered treatments have been supportive, consisting of efforts to alleviate pain and suffering, support appropriate hydration, and, in some cases, the ability to remove secondary infections [9].

CONCLUSIONS

The study found that thyme honey improved the management of radiation-induced oral mucositis and the quality of life in patients with head and neck cancer.

Data Availability

The corresponding author may give the data analyzed and utilized in this study upon request.

Competing Interests

There is no conflict of interest related to the publishing of this research report.

The authors' contributions

All authors contributed to the work described, whether it was in the conception, study design, execution, data collection, analysis, and interpretation, or all of these areas; contributed to the article's drafting, revision, or critical review; approved the final version to be published; agreed upon the journal to which the article was submitted; and acknowledge that you will be held responsible for all facets of the work.

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