The Effects of Nursing Intervention for Decrease of Oral Mucositis in Cancer Patients Receiving Chemotherapy : A Systematic Review and Meta-Analysis

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INTRODUCTION

While the survival rate of cancer patients is increasing with the development of chemotherapy, patients struggle with the side effects of chemotherapy. In particular, oral mucositis is a side effect experienced by more than 50% of patients who received chemotherapy. Therefore, by reviewing domestic and international nursing studies for the reduction of mucositis in cancer patients undergoing chemotherapy and conducting a meta-analysis by integrating the effects of the studies in a systematic and scientific way, we provide a rationale for developing an applicable intervention manual which can be applied in clinical practice.

OBJECTIVE

1. Describe the characteristics of RCT papers that applied nursing interventions for oral mucositis.
2. Assess the effect size of oral mucositis reduction through oral care nursing interventions recommended in domestic evidence-based oral nursing practice guidelines.
3. Identify the effect size of oral care nursing intervention methods based on the severity of oral mucositis and cancer type through subgroup analysis.

METHODS

1. A systematic review and meta-analysis was conducted by searching & databases.
2. Two review authors independently searched, selected, extracted, and evaluated studies.
3. Study quality was assessed using the Cochrane risk of bias assessment tool.
4. The Comprehensive Meta-Analysis V3 program was used to estimate the effect size.

General Characteristics of Study Literature	First author, year of publication, country, cancer type and number of samples, intervention group and intervention method for comparison group, stomatitis measurement tool, difference between groups, Author's conclusion
Analysis of effect size	Comprehensive meta analysis V3 program Random effects model analysis according to heterogeneity Calculate the corrected standardized mean effect size Hedges'g as the standardized mean difference, calculated by 95% confidence interval
Heterogeneity test	Forest plot
Moderating effect analysis	Meta-ANOVA analysis
Publication convenience analysis	Funnel plot

REFERENCE

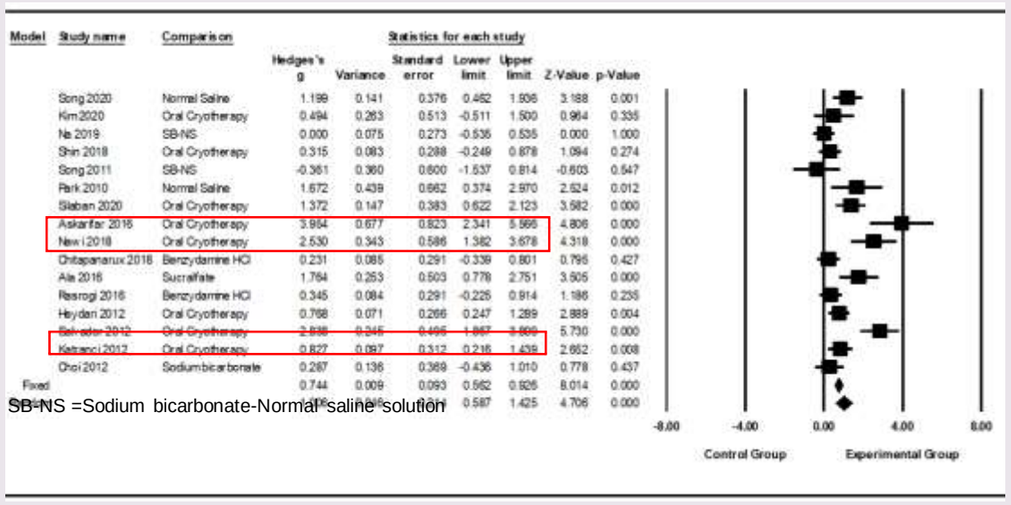
1. Annual Report of the National Cancer Registry Project (2017 Cancer Registration Statistics): Korea Central Cancer Registry. 2019
2. Yeon GS. Effects of physical symptoms on the daily performance of cancer patients [master's thesis]: Catholic University of Korea; 1988.
3. Song JE, So HS, Ju D, Kim EJ. Randomized controlled trial for prevent stomatitis and discomf-ort among acute leukemic patients. Asian Oncol Nurs. 2011

RESULTS

Out of 1,374 publications identified, 16 studies that met the inclusion criteria were utilized to estimate the extent of reduction in oral mucositis.

1. Oral cryotherapy demonstrates a substantial effect size in reducing oral mucositis in patients with all stages of stomatitis, solid cancer, and hematological cancer.
2. Normal saline function therapy also exhibits a significant effect size in the study.
3. Foreign meta-analysis studies provide support for the findings that Sucralfate is effective in reducing oral mucositis in patients with mild to severe stomatitis and solid cancer. (However, Korean papers do not support this result.)
4. The meta-ANOVA analysis revealed a significant difference in the effect size based on the severity of stomatitis.

Mucositis reduction effect size



SB-NS =Sodium bicarbonate-Normal saline solution

Effect size according to stomatitis severity

Variables	Categories	K	Hedges'g	95%CI Lower	95%CI Upper	Q(df)	p
Mild-Severe OM	Normal Saline	3	1.11	0.23	1.98	17.06(4)	.002
	Oral cryotherapy	14	0.51	0.21	0.80		
	SB-NS	5	-0.04	-0.33	0.24		
	Sodium bicarbonate	1	0.00	-0.62	0.62		
	Sucralfate	1	1.16	0.43	1.88		
Serious OM	Normal Saline	1	1.95	1.14	2.75	33.29(4)	<.000
	Oral cryotherapy	7	2.79	1.00	4.57		
	SB-NS	2	-0.11	-0.59	0.36		
	Sodium bicarbonate	1	0.57	-0.24	1.39		
	Sucralfate	1	2.37	1.18	3.57		

k=Number of studies; Q=value between subgroup; OM=Oral Mucositis; SB-NS=Sodium bicarbonate-Normal saline solution

Comparison of effects according to cancer type

Variables	Categories	K	Hedges'g	95%CI Lower	95%CI Upper	Q(df)	p
Solid Cancer	Benzydamine	3	0.31	-0.02	0.63	22.66(4)	<.000
	Normal Saline	4	1.36	0.55	2.16		
	Oral cryotherapy	19	0.66	0.40	0.91		
	SB-NS	4	0.00	-0.27	0.27		
	Sucralfate	2	1.67	0.49	2.85		
Haematological cancer	Oral cryotherapy	6	3.12	1.24	4.99	12.45(2)	.002
	SB-NS	3	-0.37	-0.97	0.23		
	Sodium bicarbonate	2	0.23	-0.32	0.78		

k=Number of studies; Q=value between subgroup; SB-NS=Sodium bicarbonate-Normal saline solution

CONCLUSIONS

In a total of 16 literature analyses, oral cryotherapy was found to be effective in reducing oral mucositis. Additionally, interventions using physiological saline and sucralfate demonstrated effectiveness as well. The study confirmed that the effects of various interventions varied depending on the cancer type and stage of stomatitis. Therefore, it is essential to implement a tailored intervention method based on the patient's type and stage, and further research is needed.