

Hospital pharmacist interventions for the management of oral mucositis in patients with head and neck cancer receiving chemoradiotherapy

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Introduction

Oral mucositis (OM) is a frequent adverse event in head and neck cancer (HNC) patients undergoing concurrent chemoradiotherapy (CCRT). While oral care by dental professionals helps prevent severe OM, the role of pharmacists remains unclear. Pharmacist oral care intervention may improve adherence to oral care agents and reduce oral complications such as OM.

Purpose

To evaluate the effectiveness of pharmacist oral care interventions in reducing OM in patients with HNC undergoing CCRT.

Materials & Methods

A multicenter, prospective cohort study was conducted between September 2019 and August 2022. The association between OM occurrence during CCRT and various factors was assessed. Comparing patients who received direct medication counseling and oral care intervention from hospital pharmacists with those who did not. This study was approved by the Research Ethics Committee of Niigata University (approval number: 2021-0269).

Results

Each oral care intervention program

	Pharmacist intervention group	Control group
Professional oral care [※]	Yes	Yes
	Sodium azulene sulfonate hydrate preparation, dimethylisopropylazulene ointment, lidocaine hydrochloride viscos, oral liquid	Others
Type of moisturizer and mouth rinse used		
The need to continue using a mouthwash and a moisturizer	Yes	No
Frequency of mouthwash more than six times a day	Yes	No
Moisturizer after mouthwash used	Yes	No
The proper storage of mouthwash (in the dark)	Yes	No

[※]A dentist or dental hygienist explains at the time of hospital admission on how to use a tooth brush, floss, sponge brush, mouth rinse, and moisturizer

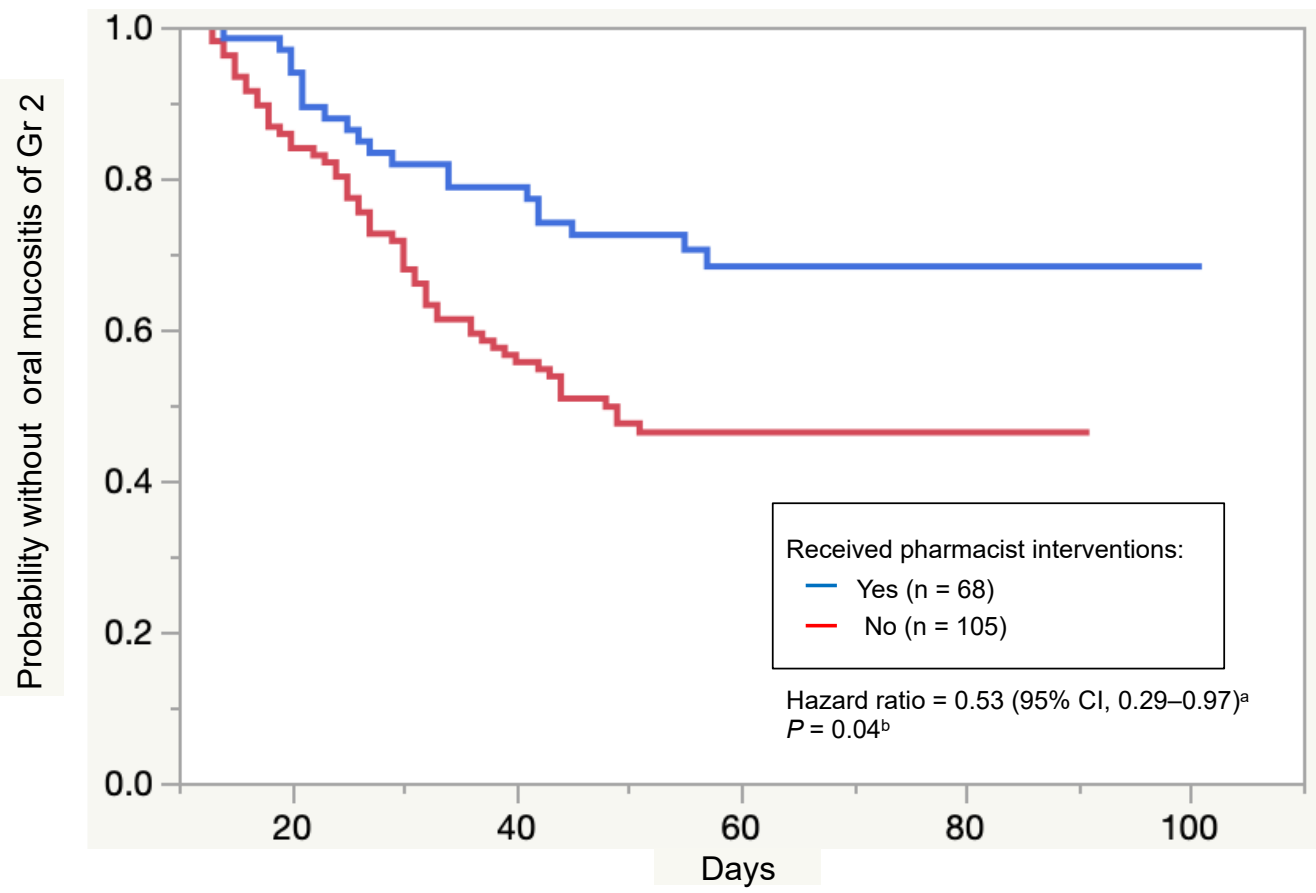
Patients characteristics

	Pharmacist intervention group (n = 68)	Control group (n = 105)	P
Age ^a	62.0 (53.3 - 70.5)	65.0 (58.5 - 70.0)	0.1 ^b
Sex (male: female)	58:10	89:16	1.0 ^c
Steroid use (%)	2.9	21.9	<0.01 ^c
Immunosuppressant use (%)	0.0	1.0	1.0 ^c
Radiotherapy modalities (IMRT: 3DCRT: MIX)	62:3:3	58:40:7	<0.01 ^c
Total radiation dose (70 Gy≥: 70 Gy<)	53:15	58:47	<0.01 ^c
Cancer stage (%)	1:2:3:4	13.3:16.7:11.7:58.3	0.4 ^c
Type of mouthwash and moisturizer used (%)			
Sodium azulene sulfonate hydrate preparation	87.7	41.5	<0.01 ^c
Dimethylisopropylazulene ointment	84.6	28.6	<0.01 ^c
Sodium azulene sulfonate hydrate + sodium	55.4	43.4	0.2 ^c
Steroidal anti-inflammatory agent	4.7	3.8	1.0 ^c
Japanese traditional drug Hangeshashinto	1.6	8.5	0.1 ^c
Lidocaine hydrochloride viscos	46.2	64.2	<0.05 ^c
Others [※]	0.0	50.9	<0.01 ^c
Length of hospital stays (day) ^a	60.0 (57.0 - 70.0)	62.0 (53.5 - 77.0)	0.5 ^b

IMRT, intensity-modulated radiotherapy; 3DCRT, three-dimensional conformal radiotherapy
[※]Others: Amphotericin B, benzethonium chloride, betamethasone valerate, and gentamicin sulfate, diclofenac sodium, glycerin, sodium alginate, sodium bicarbonate, tranexamic acid, and white petroleum
^a Data are presented as the median (interquartile range [IQR]), unless otherwise indicated.
^b Mann-Whitney U test, ^c Fisher's exact test

- Explain the importance of gargling and maintaining adequate oral moisture.
 - Verify whether the patient has adhered to the recommended usage frequency of six or more times per day.
 - struct patients to apply moisturizing agents immediately after gargling.
 - Ensure that the gargling solution is stored in a dark place to maintain stability.
- [※]The intervention was administered once per week throughout the treatment period

A Logistic Regression and Kaplan–Meier Survival Analysis with Log-Rank Test for Grade 2 Oral Mucositis



Group	Gr 2 oral mucositis	aOR (95% CI)	P
pharmacist oral care interventions			
Yes	19/63 (30.16%)	0.42 (0.18-0.96)	0.04
No	56/105 (53.3%)	-	-

Adjusted radiotherapy modalities, radiation dose, steroid use, and type of mouthwash

The median Gr 2 OM-free periods were approximately 55.5 (min–max, 14.0–101.0) in the pharmacist oral care intervention group and 44.0 (13.0–91.0) days in the control groups, respectively. The time to onset of Gr 2 OM was significantly longer in patients receiving pharmacist oral care intervention group than in patients in the control group (hazard ratio 0.53; 95% CI, 0.29–0.97; P = 0.04).

Logistic regression analysis of independent factors for Gr 2 OM was significantly lower in patients receiving pharmacist oral care interventions group than in patients in the control group (adjusted odds ratio, 0.42; 95% CI, 0.18–0.96; P = 0.04).

Discussion & Conclusion

- This multicenter, prospective cohort study is the first to demonstrate that pharmacist oral care intervention, supported by e-learning, significantly reduce the incidence of Gr 2 in patients with HNC undergoing concurrent CCRT.
- Oral care education instruction by pharmacist on gargle and moisturizer can significantly reduce Gr 2 OM. Pharmacists, as medication specialists, worked with dental professionals to enhance patient's oral care compliance.
- There were biases such as differences in radiation modality (more IMRT in the intervention group) and steroid use, which may have influenced results.
- Despite variability across hospitals in pharmacist-dentist collaboration, the findings suggest that pharmacist involvement in oral healthcare teams can benefit patient care.
- Future studies should aim to establish structured pharmacist roles in oral care for broader clinical implementation.