

Oral mucous membrane condition of the patients with chronic obstructive pulmonary disease and the measures taken for the protection

 Derya Tuluçe¹,  Emine Kaplan Serin²,  Sevinc Kutlurkan³

¹Department of Nursing, Faculty of Health Sciences, Harran University, Sanliurfa, Turkey

²Department of Nursing, Faculty of Health Sciences, Gaziantep University, Gaziantep, Turkey

³Department of Nursing, Faculty of Nursing, Ankara University, Ankara, Turkey

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Abstract

Aim: This study was carried out to evaluate the oral mucous membranes of patients with chronic obstructive pulmonary disease and to determine the measures taken for the protection of oral mucous membranes.

Materials and Methods: This study was carried out as a descriptive and cross-sectional study. This study was carried out with 200 patients admitted to the chest diseases polyclinic and clinic of a hospital. The patient information form, the "Oral Mucosa Risk Assessment Form" and the "Oral Evaluation Guide" were used in the evaluation of data.

Results: A significant positive relationship was found between the mean score of oral mucosa risk assessment form and the mean score of oral evaluation guide. A statistically significant positive relationship was found between the mean score of oral mucosa risk assessment form and the mean score of oral evaluation guide and age, year of disease and the duration of inhaler use.

Conclusion: According to the results, it was observed that the oral care of COPD patients was moderate; however, they did not pay sufficient attention to tooth brushing. Nursing approaches for the prevention of oral mucous membranes should be determined in patients with chronic obstructive pulmonary disease.

Keywords: Chronic obstructive pulmonary disease; nursing; oral care

INTRODUCTION

Chronic obstructive pulmonary disease is an important disease with high prevalence and an ever-increasing morbidity and mortality. The World Health Organization estimates that COPD will be the third cause of death all over the world by 2030 (1). Patients have symptoms such as dyspnea, cough and sputum and problems such as airway obstruction, risk of exacerbation and other comorbid diseases (2).

Although the severity of dyspnea varies depending on the stage of COPD, the fact that the patients with dyspnea have oxygenation problems and receive long-term oxygen therapy leads to oral and dental problems in patients (3). Different treatment options are also preferred according to the stage of the disease in the treatment of COPD patients. These treatments are long-acting bronchodilators, long-acting anticholinergics, long-acting β_2 -agonists and inhaler corticosteroids. Although these treatments reduce the symptoms of the patients, many side effects are observed (4,5). Oral mucous membrane problems are

most frequently observed due to inhaler therapies. The local side effects of inhaler drugs are fungal infections, cough in inhalation, hoarseness, dryness of the mouth, dysphagia and candida associated stomatitis (6). Along with these problems, poor oral health is an important risk factor for nosocomial pneumonia in patients. Losses of teeth may be observed in those patients. Standard oral hygiene prevents the losses of teeth, is useful in the treatment of prophylaxis of stomatitis and ensures maintaining healthy oral tissue (7).

Important personal practices are recommended and implemented to maintain the oral health of patients with chronic obstructive pulmonary disease and to solve the existing problems (8,9). The aim of this study was to evaluate the oral mucous membranes of patients with chronic obstructive pulmonary disease due to the lack of sufficient number of studies on oral care of COPD patients although there are many factors affecting oral health, and to determine the measures taken for the protection of oral mucous membranes and to raise awareness about it.

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Corresponding Author: Emine Kaplan Serin, Department of Nursing, Faculty of Health Sciences, Gaziantep University, Gaziantep, Turkey E-mail: emine_3354@hotmail.com

MATERIALS and METHODS

Type of the study, sample and study plan

The data of the study were collected by the researcher in the patient room in the chest diseases clinic of a private hospital between November 2016 and March 2017. The forms were filled out in approximately 10 minutes. Whether patients had dental problems was evaluated by the dentist.

200 patients hospitalized with the diagnosis of COPD in the Chest Diseases Clinic between the dates of the study constituted the sample of the study. The inclusion criteria for the study were using inhaler drugs, being 18 years of age and over, being able to establish healthy communication, having no hearing and/or speech problem, being literate, and volunteering to participate in the study. The exclusion criteria for the study were having no diagnosis of COPD, being under 18 years of age, inability to establish healthy communication, having hearing and/or speech problem, being illiterate, and unwillingness to participate in the study.

Data collection tools

In this study, patient information form, oral mucosa risk assessment form and the oral evaluation scale were used.

Patient Information Form: This form consisted of a total of 23 questions examining the descriptive characteristics of patients, gender, age, marital status, educational status, place of living, employment status, diagnosis and year of disease, smoking status, group of inhaler drugs used, duration of inhaler use, comorbid diseases, any dental disease status, number of missing teeth, number of teeth brushing per day, use of dental floss, and the practices to ensure oral hygiene.

Oral Mucosa Risk Assessment Form: Oral mucosa risk assessment form is a form that evaluates patients' mental state, lips, mucous membranes, liquid food intake, tongue, age, teeth/dental brace/dentures, salivary status, airway supportive treatments, drugs used and additional diseases. This form consists of 10 questions. The first 8 questions include four options scored from 0 (no problem) to 3 (serious problem). The ninth question includes airway supportive treatments and varies between 0 and 4 points. In the last question, each of 7 risky situations can only be marked as 4 points. The scores to be obtained from this form range from 0 to 56. The oral mucosa risk increases as the score obtained from the form increases. According to the results of this assessment, those with a score of 30 and higher are considered as high risk group, those with a score of 24-29 are considered as moderate risk group, and those with a score of 23 and below are considered as low risk group.

Oral Evaluation Guide: It was created by Yıldız as a result of reviewing various guides. Oral Evaluation Guide includes questions such as swallowing, structure of lips, moisture of lips, moisture and color of tongue, moisture of palate, status of saliva and mucous membranes. Oral mucous membranes were evaluated using inspection and palpation methods. It was scored by giving the values 1,

2 or 3. The minimum and maximum scores in the Oral Evaluation Guide are 7 and 21, respectively. If the patient's score of the Oral Evaluation Guide is 7, it indicates that the oral mucous membrane is healthy and that oral care is required with 2x1 - 3x1 frequency. If the score of the Oral Evaluation Guide is between 7-14, it indicates the oral health is about to deteriorate and therefore oral care should be given at a frequency of 4x1-6x1, and the score of the Oral Evaluation Guide is between 14-21, it indicates the oral health is impaired and therefore oral care should be given at a frequency of 6x1 or more (1).

Evaluation of data

All analyses were performed using SPSS (Statistical Package for Social Science) 22.0 package program. Descriptive analyses were presented as number, percentage, mean and standard deviation. In the analysis of the data, the normality hypothesis was investigated using the Kolmogorov-Smirnov test. Student T Testi and ANOVA was used in normality distribution of the data while Mann-Whitney U Test and Kruskal Wallis Test was used for the data that did not show normal distribution. The correlation between the mean score of the scales correlation Pearson correlation test was used. The result were evaluated p <0.05 significance level.

Ethical permissions

The written permissions from Gazi University Ethics Committee (25.04.2016-230) and the private hospital where the application was performed and informed consents from the patients who met the specified criteria and volunteered to participate in the study were obtained.

RESULTS

The average age of the patients was 66.76 ± 11.02 , 60% of them were at the age of 65 and over, 54.5% of them were female, and 87% of them were married. Of the patients, it was determined that 44% were illiterate, 87% were unemployed, 77.5% had different diseases other than COPD and 27.5% of them had diabetes, 45% of them had hypertension, and 34% of them had cardiovascular disease, 54% were non-smokers, Salbutamol by 92%, Budesonide by 68.5% and Formoterol by 32.5% ranked first among the drugs used, 31.5% had dental disease, 84.5% brushed their teeth once a day or never brushed, and 97% did not use dental floss (Table 1).

It was determined that the patients' mean year of disease was 7.96 ± 7.04 , the duration of inhaler use was 5.98 ± 5.70 ; and in terms of the averages according to the region of missing teeth, lower right was 1.99 ± 1.81 , upper right was 1.73 ± 1.78 , lower left was 1.92 ± 1.69 and upper left was 1.74 ± 1.74 (Table 2).

When the frequency of applications performed by patients to ensure oral hygiene was examined, it was determined that 88% of them used air chamber while taking inhaler drugs, 48.5% of them rinsed their mouth for sufficient time with water or the prescribed solution and 48.5% of them took nutritional supplements and sufficient liquid.

Table 1. Patients' sociodemographic and disease characteristics, and the mean scores of the oral mucosa risk assessment form and the oral evaluation guide							
		n	%	Oral Mucosa Risk Assessment.	p	Oral Evaluation Guide	p
Age	<65	80	40	11.575±6.031	0.000	10.912±2.715	0.000
	65 and older	120	60	21.558±9.165		14.033±3.906	
Gender	Female	109	54.5	18.275±9.628	0.244	12.899±3.744	0.643
	Male	91	45.5	16.714±9.142		12.648±3.871	
Marital Status	Married	174	87	18.339±9.656	0.002	13.092±3.908	0.003
	Single	26	13	12.384±5.374		10.730±1.970	
Educational Level	Illiterate	88	44	-		14.215±3.706	0.000
	Literate	71	35.5	-		12.788±3.418	
	Primary Education	25	12.5	-		10.600±2.738	
	Secondary School	1	0.5	-		14.000	
	High School	12	6	-		8.166±1.193	
Employment Status	Undergraduate and higher	3	1.5	-		7.000±0.000	
	Employed	26	13	7.807±5.036	0.00	9.346±2.513	0.00
	Unemployed	174	87	19.023±9.052		13.298±3.689	
Comorbid Disease	Yes	155	77.5	19.064±9.524	0.000	13.238±3.962	0.002
	DM	55	27.5	-		-	
	HT	90	45	-		13.555±4.324	0.009
	KVH	68	34	23.720±9.179	0.000	14.823±4.073	0.000
	Other Diseases	20	10	21.850±8.646	0.032		
Smoking Status	Yes	29	14.5	-		11.655±2.906	0.036
	No	108	54	-		12.555±3.687	
	Quitted	63	31.5	-		13.698±4.172	
Drugs used	Formoterol	65	32.5	23.753±8.052	0.000	15.569±3.553	0.000
	Salbutamol	184	92	-		12.951±3.810	0.035
	Budesonid	137	68.5	18.576±9.345	0.025	13.182±3.548	0.029
	Tiotropium bromur	31	15.5	22.903±9.850	0.001	14.419±3.128	0.009
	Salmeterol	3	1.5	-		-	
	Other	51	25.5	25.823±9.797	0.000	15.019±4.240	0.000
Dental Disease	Yes	63	31.5	23.174±9.227	0.000	14.587±4.030	0.000
	No	137	68.5	14.985±8.349		11.956±3.386	
Number of teeth brushing per day	1 and below	169	84.5	18.958±9.257	0.000	13.289±3.764	0.000
	2 and above	31	15.5	9.967±6.161		10.032±2.626	
Use of dental floss	No	194	97	-		-	

p > 0.05, p > 0.001

Table 2. Comparison of some characteristics of patients and oral mucosa risk assessment classification					
	X±SD	Low risk (143)	Moderate Risk (33)	High risk (24)	p
Age	66.76±11.02	62.94±9.74	74.27±7.56	79.20±7.24	0.000
Year of Disease	7.96±7.04	5.14±4.73	13.96±7.21	16.50±6.44	0.000
Duration of Inhaler Use	5.98±5.70	3.80±3.94	10.66±5.98	12.54±5.46	0.000
Oral Evaluation Guide	12.78 ±3.79	11.384±2.833	15.151±3.143	17.875±3.745	0.000
	Missing tooth lower right	Missing tooth lower right	Missing tooth lower left	Missing tooth upper left	Oral Mucosa Assessment
X±SD	1.99±1.81	1.73±1.78	1.92±1.69	1.74±1.74	17.56± 9.41
Oral Evaluation Guide - Oral Mucosa Risk Assessment Form			r=0.780	p=0.000	

However, it was determined that very few patients (21%) brushed their teeth after each meal, 16.5% of them avoided sugary foods or drinks between meals, 11.5% of them brushed their teeth after using inhaler, 9% of them had a regular dental examination at least every 6 months, they rinsed their mouth (4%) with Chlorhexidine mouth rinsing solution (0.2%), and they rinsed their mouth (1.5%) with basic mouth rinsing (milk, water, 0.05% mouth rinsing sodium fluoride) before bed and after using inhaler (Table 3).

The mean score of oral mucosa risk assessment form of the patients was found to be 17.56 ± 9.41 . In the oral mucosa risk assessment classification of the patients, it was determined that 71.5% of them (143) were in the low risk group, 16.5% of them (33) were in the moderate risk group and 12% of them (24) were in the high risk group. The mean score of oral evaluation guide of the patients was determined to be 12.78 ± 3.79 (Table 2).

The statistical difference between oral mucosa risk assessment and oral evaluation guide, apart from gender and the use of dental floss which are the descriptive characteristics of the patients, was found to be significant ($p < 0.05$). The difference between the mean age of the disease, the duration of inhaler use, and the mean of oral evaluation guide and oral mucosal risk assessment classification was found to be significant ($p < 0.001$). A positive relationship was determined between oral evaluation guide and oral mucosa risk assessment form ($p < 0.001$) (Table 2). According to the data of the study, oral mucosa score classification increased as the age, the duration of inhaler use and the year of disease increased. The mean scores of oral mucosa risk assessment form and oral evaluation guide scores decreased as the level of education increased.

Table 3. Frequency of patients' applications to ensure oral hygiene

Application	%
Using air chamber while taking inhaler drugs	88
Rinsing mouth for sufficient time with water or the prescribed solution	48.5
Taking nutritional supplements and sufficient liquid	48.5
Brushing teeth after each meal	21
Avoiding sugary foods or drinks between meals	16.5
Brushing teeth after inhaler use	11.5
Having a regular dental examination at least every 6 months	9
Rinsing mouth with chlorhexidine mouth rinsing solution (0.2%)	4
Rinsing mouth with basic mouth rinsing (milk, water, 0.05% mouth rinsing sodium fluoride) before bed and after using inhaler	1.5

DISCUSSION

In this study, according to the oral evaluation guide, the oral care of the patients was evaluated at a moderate level and they need to perform oral care at least four times a day. According to oral mucosa risk assessment survey, approximately $\frac{3}{4}$ of the patients were in the low risk group.

In the studies carried out with COPD patients, it was observed that the patients were at the age of 65 and over. The studies indicate that elderly people have poor oral health. The losses of teeth are observed in patients due to poor oral hygiene and impaired oral health (10-12). In our study, it was concluded that patients had poor oral hygiene. It was observed that the patients had approximately two teeth losses in the right lower-upper and left lower-upper teeth. Therefore, it should be considered that elderly COPD patients are more at risk and applications for the protection of oral health should be performed.

The oral and dental health of COPD patients deteriorates due to the use of inhalers (4). These problems are observed more frequently in patients using inhaler anticholinergics and steroids (13). The most important side effect observed in the patients using long-acting anticholinergic and

combined inhaler steroids is oral candida (14). The three most commonly used drugs in our study were Salbutamol, Budesonide and Formoterol respectively. Although there are no symptoms related to oral health in the side effects of Salbutamol and Formoterol, the common side effects of Budesonide include oral candidiasis. A study was carried out by Dekhuijzen et al. with COPD patients using a combined inhaler. According to the result of the study, the risk of candidiasis was higher in patients taking steroids. This risk varied depending on the dose of the drug (15).

It is known that COPD patients are at higher risk for reasons such as inhaler use, oxygen therapy and nutrition (3-5). In our study, it was determined that the patients mostly brushed their teeth once a day or never brushed, and only three people used dental floss. In a study in which Bhavsar et al. compared the individuals with COPD and healthy individuals, it was statistically significant that the patients with COPD had less tooth brushing and more plaque and gingivitis development (16). According to these results, it is necessary to evaluate the oral health of individuals with COPD more frequently and to provide training on this subject.

In their study, Saltness et al. found that the individuals with higher education, smoking and oral health problems had lower quality of life associated with oral health. It was determined that the patients with higher educational level had better oral health, and the non-smokers and those with dental problems had poor oral health. According to the oral evaluation guide, it was determined that the patients needed more frequent oral care (12). This information is similar to our study.

In the study carried out by Baldomero et al. according to the information given by the patients, the number of exacerbations in patients with less than 4 teeth was not statistically significant. In our study, missing teeth of patients were considered as low risk according to the score of oral risk assessment form of patients (17).

LIMITATION

The acquisition of data with scales in the study and failure to use methods such as observation can be considered as the limitations of the study.

CONCLUSION

According to the results, it was observed that the oral care of COPD patients was moderate, however, they did not pay sufficient attention to tooth brushing. Since it is known that the inhaler use of patients with COPD impairs oral mucosa, elderly people's oral health should be evaluated more frequently. Maintaining oral mucous membrane integrity in individuals with chronic obstructive pulmonary disease will allow them to have a better quality life by ensuring the continuity of nutrition and communication functions. Applications should be made to protect oral health for the patients with COPD, and trainings should be provided for them.

Relevance to clinical practice

Oral mucosal membrane problems are frequently seen as a result of the side effects of inhaler drugs used in patients with chronic obstructive pulmonary disease. In addition, education levels of patients with chronic obstructive pulmonary disease affect oral care characteristics. Nursing approaches for the prevention of oral mucous membranes should be determined in patients with chronic obstructive pulmonary disease.

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