

Prevalence of Most Common Tongue Lesions Related to Degenerative Diseases in the Elderly

Adiastuti Endah Parmadiati¹, Diah Savitri Ernawati¹, Fatma Yasmin Mahdani^{1*},
Nurina Febriyanti Ayuningtyas¹, Meircurius Dwi Condro Surboyo¹, Aulya Setyo Pratiwi¹,
Riyan Iman Marsetyo¹, Candrika Ramya Inastu², Vint Erawati²

1. Department of Oral Medicine, Faculty of Dental Medicine, Universitas Airlangga, Surabaya-Indonesia.

2. Undergraduate Student of Dental Medicine, Faculty of Dental Medicine, Universitas Airlangga, Surabaya-Indonesia.

Abstract

Population aged 60 years old and above are growing in number. The increase was due to the increasing life expectancy in Indonesia; a fact that will have an impact on general and oral health in the future. Tongue lesions are related to degenerative diseases such as diabetes mellitus, hypertension and heart disease. The purpose of this study was to determine the prevalence of tongue lesions related to degenerative diseases in the elderly at Ketabang Public Health Center, Surabaya City, East Java. This is an observational descriptive study with a cross-sectional design. Intraoral soft tissue examination was performed by the general dentist and oral medicine specialist in elderly patients coming to Ketabang Public Health Center between January and March 2020. During this period, there were 85 elderly patients with degenerative diseases and prevalence of tongue lesions, namely fissured tongue (77.6%), coated tongue (67.1%), crenated tongue (32.9%), atrophic glossitis (29.4%), lingual varices (12.9%), and oral melanotic macule (1.1%). Fissured tongue is the most common tongue lesion found in 77% elderly patients with degenerative diseases. Fissured tongue often develops with age and in patients with hyposalivation related to diabetes mellitus and anti-hypertension drugs.

Clinical article (J Int Dent Med Res 2021; 14(4): 1569-1572)

Keywords: Oral medicine, geriatric dentistry, tongue, mouth diseases, human and health.

Received date: 01 July 2021

Accept date: 26 October 2021

Introduction

The number of elderly people in Indonesia continues to increase. The elderly is at risk of developing degenerative diseases due to decreased body function. Other factors that can increase risk are poor daily behavior such as smoking, alcohol consumption, and poor nutrition.¹ Age has an important influence on the appearance of soft tissue disorders of the oral cavity. As we get older, the prevalence of soft tissue disorders of the oral cavity is higher. Aside from age, other factors such as drug use and degenerative diseases can trigger soft tissue abnormalities.² Oral mucosa has decreased function. The physical and immunological defenses of the mucous membrane are impaired,

their regenerative abilities are reduced and they are more susceptible to trauma.³

As many 64% of the elderly have oral cavity lesions. The location of the most abnormalities is 78.57% on the tongue. Lesions on the tongue are associated with the elderly with hematological disease, diabetes mellitus, dermatology, and some gastrointestinal ailments.⁴ The tongue in particular is reported to show marked clinical changes and to become smoother with loss of filiform papillae. With age, there is a tendency for the development of sublingual varices and increasing susceptibility to various pathological conditions such as *Candidal* infection and a decreased rate of wound healing.⁵

Routine examination of the oral cavity in the elderly is highly recommended to reduce the rate of tongue lesions in the elderly with degenerative diseases. Until now there have not been many studies that can provide an overview of the tongue lesion in the oral cavity related to degenerative diseases in the elderly. This research is expected to be useful as optimal treatment standards for dentists as well as input

*Corresponding author:

Fatma Yasmin Mahdani,
Department of Oral Medicine, Faculty of Dental Medicine,
Universitas Airlangga, Jl. Mayjen Prof. Dr. Moestopo No.47
Surabaya 60132-Indonesia,
E-mail: fatmayasminmahdani@fkg.unair.ac.id

for health workers in the management of patients with degenerative diseases related to the impact of drug use on tongue lesions.

Materials and methods

This is an observational descriptive study with a cross-sectional design approved by Universitas Airlangga Faculty of Dental Medicine Health Research Ethical Clearance Commission with the registration number is 363/HRECC.FODM/VI/2019. This study was conducted in Ketabang Public Health Center Surabaya from January-March 2020. From this center, the elderly who were gathered were asked to participate in this study and sign an informed consent. Sample obtained from all elderly who participated and met the inclusion criteria.

Screening was performed by an oral medicine specialist and students from the oral medicine specialist program of the Oral Medicine Department, Faculty of Dental Medicine, Universitas Airlangga. Inclusion criteria included subjects with age more than 60 years old and who had degenerative disease (hypertension, diabetes mellitus, coronary heart disease, and chronic kidney disease). While healthy elderly without degenerative disease, had age less than 60 years old, and subjects with difficulty in mouth opening were excluded from this study. Data collection procedures for this study are anamnesis and clinical examination. The data obtained will be presented descriptively in the form of a percentage and by using a prevalence rate.

Results

Study was conducted in the period time and a total of 92 elderly participated. After screening was performed, only 85 elderly met the inclusion criteria and included in this study. Out of 85 subjects, 30 elderly were male (35.3%) and 55 elderly were female (64.7%). Majority of the participant's age group are 60-74 years old. Anamnesis was performed to identify underlying diseases especially degenerative diseases, and it was found that hypertension is the most common degenerative disease suffered by elderly in this study (n=61; 71.8%). Demographic data including degenerative diseases that subjects had suffered are presented in Table 1.

Demographic aspect	Number of subjects	Percentage
Sex		
Male	30	35.37%
Female	55	64.7%
Age		
60-74 years old	77	90.6%
75-90 years old	8	9.4%
>90 years old	0	0%
Degenerative disease		
Hypertension	61	71.8%
Diabetes mellitus	33	38.9%
CHD	9	10.6%
Osteoarthritis	1	1.1%

Table 1. Demographic data from elderly who met inclusion criteria of the study.

A total of 188 tongue lesions from 63 subjects were identified from intraoral clinical examination. Tongue lesions found were fissured tongue, coated tongue, crenated tongue, atrophic glossitis, lingual varices, and oral melanotic macule. Most common tongue lesion was fissured tongue (n=66; 77.6%) and oral melanotic macule was the least common tongue lesion found in this study (n=1; 1.1%). Tongue lesions identified from this study are presented in Table 2.

Tongue Lesion	Number of subjects	Percentage
Fissured tongue	66	77.6%
Coated tongue	57	67.1%
Crenated tongue	28	32.9%
Atrophic glossitis	25	29.4%
Lingual varices	11	12.9%
Oral melanotic macule	1	1.1%
Total subjects	85	

Table 2. Prevalence of tongue lesion in elderly with degenerative diseases.

Discussion

Nowadays, global population has aged and increased life expectancy significantly in some Asia countries including Indonesia. This demographic condition has a major impact on both general and oral health, especially in the older age group.⁶ People over 60 years old are considered elderly because at this age physical and physiological abilities are declined, known as the aging process.⁷ In elderly there are four diseases closely related to aging process: cardiovascular disorder, hormonal metabolism

disorder, joint disorder, and neoplasm. According to data of Ministry of Public Health Indonesia, most common aging-related disease or known as degenerative disease found in elderly is hypertension.⁸

In this study, 61 subjects (71.8%) have diagnosed with hypertension and most of them had undergone treatment with anti-hypertensive drugs. The same study in India reported that 59.1% of elderly have hypertension as degenerative disease.⁹ In aging process blood pressure tends to increase, partially because of decreased compliance of aorta and flexibility in arteries. As the age increase, systolic pressure continuously increases and becomes a risk factor of heart disease if greater than 140 mmHg.¹⁰

Recent studies suggested a link between systemic disorders and impaired oral function. Although elderly remain healthy when visited medical or dental providers, there is an increased rate of age-related changes in oral cavity resulting from underlying illness and medications taken.^{11,12} In normal aging process, oral cavity undergoes extensive physiological changes including oral mucosa, tongue, and salivary glands.¹³ Due to decreased elastic fiber and vascularization, mucosa become less elastic, pale, thin, and susceptible to injury or infection. In salivary glands, atrophy of duct cell walls causes salivary flow impairment so that oral cavity becomes dry. Some changes also appear on the tongue such as atrophic papillae, lingual varices, and fissured tongue.^{14,15}

Tongue is a remarkable muscular organ in oral cavity. It becomes a good indicator in oral and general clinical examination because of the easy clinical accessibility.¹⁶ Abnormality of the tongue can be used as basic clinical evidence of underlying disease and conditions, so that early recognition can help the clinician to provide appropriate treatment.

Most common tongue lesions in this study were fissured tongue (77.6%) followed by coated tongue (67.1%). Similar to a study at nursing home in Yogyakarta, fissured tongue was reported as the most common tongue lesion (64.9%). Another study conducted in Surabaya with geriatric patients as its subject reported that coated tongue was the most common tongue lesion (55.6%) while in this study appear as the second most common lesion.^{17,18} Fissured tongue is considered as normal variance of oral mucosa seen in up to 20-30% of population. This

condition is characterized by multiple fissures and grooves on the dorsal aspect of the tongue.¹⁹

Fissured tongue has several variations based on position as medial and lateral types. The appearance of grooves or furrows typically on dorsolateral area of the tongue considered as lateral types, while central fissure with several branches from the central form considered as medial types. But in severe form, numerous fissure can form multiple separate lobules that cover the entire dorsal surface.²⁰ Usually fissured tongue is asymptomatic, but in some cases, mild pain is reported. Any symptoms from fissured tongue are often associated with poor oral hygiene where food debris is trapped in the fissure and causes inflammation.²¹ The cause of fissured tongue is idiopathic, but it can be developed from aging process and hyposalivation.^{18,19}

In this study, tongue lesion was observed in elderly with degenerative disease and reported that fissured tongue is the most common lesion coexistent with hypertension followed by diabetes mellitus. An epidemiological study from India reported the same result as ours, most of the subjects with hypertension had fissured tongues followed by coated tongues.²⁰ Contradicting with study result from Hungaria, fissured tongue was reported coexistent with diabetes mellitus followed by hypertension, and supported by other study stated that fissured tongue was associated with geographic tongue.^{20,22}

The association between fissured tongue and systemic condition has not been researched extensively in the literature. A study stated that tongue lesion was not significantly associated with any systemic illness.¹⁶ But some literature found that fissured tongue associated with several syndromes like Melkersson-Rosenthal syndrome, Coffin-Lowry syndrome, Fraser's Syndrome, Down's syndrome, Oral-Facial-Digital Syndrome Type I, Mohr Syndrome, Pierre Robin Syndrome, Maroteaux-Lamy Syndrome, ECC syndrome, and even Sjogren syndrome.²⁰ Antihypertensive medication like ACE inhibitors may lead to xerostomia¹⁶ where hyposalivation xerostomia can be one factor causing fissured tongue to develop especially in elderly with hypertension. But this indirect association cannot be confirmed in this study because any medications of hypertensive patients didn't attribute in data collection so that this association needs further investigation in near future.

This study has a new point of view in observation of oral mucosal lesions which focused on tongue lesions only. It can be advantageous for some clinicians because tongue has easy accessibility to be used as a daily clinical examination so that some changes and abnormalities manifest on the tongue can be detected early. However, the result of this study should be interpreted with caution because of some limitations like small sample and single-center study. We recommend further investigation of a specific variable on a large random sample and can be done in a multi-center population.

Conclusions

Fissured tongue is the most common tongue lesion found in elderly with degenerative diseases. Fissured tongue often develops in aging process and patients with hyposalivation related to anti-hypertension drugs and diabetes mellitus.

Acknowledgements

This study was funded by Directorate of Research and Community Service, Ministry of Research and Technology/National Research and Innovation Agency at Universitas Airlangga for fiscal year 2021 (Contract Number: 275/UN3/2021). All authors thank to Department of Oral Medicine, Faculty of Dental Medicine, Universitas Airlangga, and Ketabang Public Health Center Surabaya.

Declaration of Interest

The authors report no conflict of interest.

References

1. Bestari B, Wati D. Penyakit Kronis Lebih dari Satu Menimbulkan Peningkatan Perasaan Cemas pada Lansia Di Kecamatan Cibirong. *J Keperawatan Indones*. 2016;19:49-54.
2. Indurkar MS, Maurya AS, Indurkar S. Oral Manifestations of Diabetes. *Clin Diabetes*. 2016;34(1):54-57.
3. Kaminska-Pikiewicz K, Chalas R, Bachanek T. The condition of oral mucosa in the elderly (over 65 years) of Lublin. *Curr Issues Pharm Med Sci*. 2017;30(1):39-42.
4. Asih A, Apriasari ML, Kaidah S. Gambaran Klinis Kelainan Mukosa Rongga Mulut Pada Lansia Di Panti Sosial Tresna Werdha Budi Sejahtera Banjarbaru. *Dentino J Kedokt Gigi*. 2014;2(1):7-12.
5. Razak PA, Richard KMJ, Thankachan RP, Hafiz KAA, Kumar KN, Sameer KM. Geriatric oral health: a review article. *J Int Oral Heal*. 2014;6(6):110-116.
6. Liu YCG, Lan SJ, Hirano H, et al. Update and review of the gerodontology prospective for 2020's: Linking the interactions of oral (hypo)-functions to health vs. systemic diseases. *J Dent Sci*. 2021;16(2):757-773.
7. Anorital A. Morbiditas dan Multi Morbiditas Pada Kelompok Lanjut Usia di Indonesia. *J Biotek Medisiana Indones*. 2015;4(2):77-88.
8. Misnaniarti. Analisis Situasi Penduduk Lanjut Usia dan Upaya Peningkatan Kesejahteraan Sosial di Indonesia. *J Ilmu Kesehat Masy*. 2018;8(2):67-73.
9. Lena A, Ashok K, Padma M, Kamath V, Kamath A. Health and social problems of the elderly: A cross-sectional study in Udipi Taluk, Karnataka. *Indian J Community Med*. 2009;34(2):131-134.
10. Abrams AP, Thompson LA. Physiology of aging of older adults: systemic and oral health considerations. *Dent Clin North Am*. 2014;58(4):729-738.
11. Halpern LR. The Geriatric Syndrome and Oral Health: Navigating Oral Disease Treatment Strategies in the Elderly. *Dent Clin North Am*. 2020;64(1):209-228.
12. Nam Y, Kim N-H, Kho H-S. Geriatric oral and maxillofacial dysfunctions in the context of geriatric syndrome. *Oral Dis*. 2018;24(3):317-324.
13. Qin R, Steel A, Fazel N. Oral mucosa biology and salivary biomarkers. *Clin Dermatol*. 2017;35(5):477-483.
14. Shinde SB, Sheikh NN, Sr A. Prevalence of tongue lesions in western population of Maharashtra. *Int J Appl Dent Sci*. 2017;3(3):104-108.
15. Ghom AG, Anil S, Lodam G. *Textbook of Oral Medicine*. Jaypee Brothers Medical Publishers (P) Ltd; 2014.
16. Bhattacharya PT, Sinha R, Pal S. Prevalence and subjective knowledge of tongue lesions in an Indian population. *J Oral Biol Craniofacial Res*. 2016;6(2):124-128. doi:10.1016/j.jobcr.2015.12.007
17. Agustina D. Oral hygiene and number of oral mucosal lesion correlate with oral health-related quality of life in elderly communities. *Dent J (Majalah Kedokt Gigi); Vol 47, No 1 March 2014*. 2014.
18. Mahdani FY, Radithia D, Parmadiati AE, Ernawati DS. Prevalence of oral mucosal lesions in geriatric patients in Universitas Airlangga Dental Hospital. *Acta Med Philipp*. 2019;53(5):407-411.
19. Mangold AR, Torgerson RR, Rogers RS. Diseases of the tongue. *Clin Dermatol*. 2016;34(4):458-469.
20. Sudarshan R, Sree Vijayabala G, Samata Y, Ravikiran A. Newer Classification System for Fissured Tongue: An Epidemiological Approach. Tanner M, ed. *J Trop Med*. 2015;2015:262079.
21. Rathee M, Hooda A, Kumar A. Fissured Tongue A Case Report and Review of Literature. *Internet J Nutr Wellness*. 2009;10(1):1-4.
22. Dafar A, Cevik-Aras H, Robledo-Sierra J, Mattsson U, Jontell M. Factors associated with geographic tongue and fissured tongue. *Acta Odontol Scand*. 2015;74:1-7.