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The Relationship between Diabetes Mellitus and Periodontal Condition of Prolanis Patients Kersanagara Health Center, Tasikmalaya City

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ABSTRACT

Diabetes mellitus is a chronic disease that patients suffer from throughout their lives. In the world, there are currently 422 million people with diabetes, this data has increased four times more than 30 years ago. Diabetes sufferers in Indonesia are estimated to reach 30 million people by 2030. Uncontrolled diabetes mellitus can weaken the immunity of periodontal tissue, conversely, untreated periodontal disease will worsen blood sugar balance resulting in damage to the tooth supporting tissue or periodontal tissue. Research objective: to determine the relationship between diabetes mellitus and periodontal disease in prolanis patients in the working area of the Kersanagara Health Center, Tasikmalaya City. Methodology: the method used is an analytical approach *cross-sectional*, population 37 person Prolanis patients with cases of diabetes mellitus, sampling using Totalsampling. Data analysis used the chi square test. Research results: the highest number of patients suffering from type 2 diabetes mellitus at Prolanis (78,4%) with periodontal tissue conditions mostly experienced deep pockets (64,9%). Chi square analysis obtained values, p-value= 0,002 (p<0,05), meaning that there is a significant relationship between type 2 diabetes mellitus and periodontal conditions with deep pockets in prolanis patients at the Kersanagara Community Health Center, Tasikmalaya City. Conclusion: There is a very significant relationship between diabetes mellitus and the periodontal condition of prolanis patients at the Kersanagara Community Health Center, Tasikmalaya City.

Keyword : diabetes melitus, periodontal conditions, prolanis patients

Introduction

Data from the International Diabetes Federation in 2015 states that the estimated number of people with diabetes mellitus in Indonesia is estimated at 10 million. Like the conditions in the world, diabetes mellitus now is causes of death in Indonesia with a percentage of 6,7% [1]. The increase in the prevalence of diabetes reached 10.9% in 2018, prepalent, increasing to 11,7% or around 9,1 million in 2023 [2]. If left untreated, this condition can lead to decreased productivity, disability, and premature death [1]. A person is said to have diabetes if they have a fasting blood sugar level of > 126 mg/dL, *a post-prandial* blood sugar level after a meal >180 mg/dL, and a test at >200 mg/dL. Blood sugar

levels throughout the day vary which will increase after meals and return to normal within 2 hours [3]. Complications of diabetes that occur in patients will experience damage to periodontal tissue, this is the most common complication in diabetics with a high prevalence rate due to changes in blood vessels, impaired neutrophil function, collagen synthesis, microbiotic factors, and genetic predisposition [4]. The number of cases of periodontal disease in the community is quite high even though many people are not aware of it, and this disease is the main cause of tooth loss in adults, usually patients complain that their teeth are shaky so that they fall off easily [5]. Periodontitis is the sixth largest complication among a wide variety of diseases and diabetes mellitus is the number one largest complication specifically in the oral cavity. About 80% of patients with diabetes mellitus have problems with their dental support tissue/periodonium.

Method

The research design used is descriptive analytical with a *cross sectional approach method.*The research will be carried out in March 2024 at the Kersanagara Health Center, Tasikmalaya City, the determination of the total sampling sample, namely all diabetes patients in prolanis as many as 37 people, with an age range of 46 years to ≥ 68 years. Before the implementation of the research, respondents are required to fill out the informed consent first. The implementation of the research began from Blood sugar checks using *Accu-Chek with the help of medical personnel at the health center and continued with pocket depth checks with CPITN status measurements and fill-in*. The results obtained from blood sugar data and periodontal tissue conditions were analyzed with *chi square test*, this was intended to test the relationship between Diabetes Disease and the patient's Periodontal condition, the results were recapitulated with exccel and statistically analyzed with SPSS version 22.

Result and Discussion

Distibustion of frequency of respondents with Prolanis diabetes mellitus based on age.

Table 1. Frequency Distribution of Respondents by Age

No	Age Criteria	n	%
1	46-58 year	12	32,4
2	59 -67 year	20	54,1
3	≥ 68 year	5	13,5
Total		37	100%

Based on table 1 shows that the results of periodontal examination with *CPITN measurement* in respondents with diabetes mellitus in Prolanis.

Table 2. Condition Frequency Distribution Periodontal Based on Criteria CPITN *Examination*

No	CPITN *Criteria*	n	(%)
1	There is subgingival calculus	5	13,5
2	Shallow pockets	8	21,6
3	Deep pockets	24	64,9
	Total	37	100

Based on table 2 shows that the results of periodontal examination with *CPITN measurement resulted in the* most respondents with the condition of experiencing deep pockets as many as 24 people or around (64,9%).

Table 3. Cross-tabulation of diabetes with CPITN Patient

Diabetes	*Status Periodontal (CPITN)*						Total	
	Calculus		Shallow pockets		Deep pockets			
	n	(%)	n	(%)	n	(%)	n	(%)
Type 1	0	0	8	21,6	0	0	8	21,6
Type 2	5	13,5	0	0	24	64,9	29	78,4
Total	5	13,5	8	21,6	24	64,9	37	100

Tabel 4. Relationship Statistics Test Results Diabetes with Conditions Periodontal

Variable	Alpha	*p-value*
Diabetes with periodontal conditions	0,05	0,003

Based on table 4 above shows that the results of *the chi square* test obtained a *p-value* of 0,003. Because the result is smaller than p= 0,05. So the conclusion is that there is a very significant relationship between Diabetes and the periodontal condition of prolanis patients at the Kersanagara Health Center, Tasikmalaya City, the results of the patient's research experience shaky in their teeth.

Periodontal tissue is a dental support tissue that consists of soft tissue and hard tissue. The prevalence of periodontal disease is the highest disease prevalence with the second order in dental and oral disease problems, reaching 96,58% [5]. Periodontal disease weakens the bones and tissues that surround and support the tooth and if left untreated, it will cause the tooth to shake and eventually lose the tooth [6]. People with diabetes will be more at risk of developing periodontal disease because they are less able to fight off infections in general. Diabetes causes blood vessels to thicken, causing disruption of the flow of nutrients and blood [7]. This weakens the bones surrounding the teeth, as well as the gums, and makes them susceptible to infection. Diabetes also raises glucose levels in saliva, and because harmful bacteria in the mouth are fed by glucose, people with diabetes are more likely to produce plaque, tartar and gingivitis and periodontal disease eventually [8].

Damage to periodontal tissue makes the gums no longer attached to the teeth, bones become damaged, and over time the teeth become shaky [9]. The number of cases of periodontal disease in the community is quite high even though many people are not aware of it, and this disease is the main cause of tooth loss in adults [10]. Periodontitis is the sixth largest complication among various diseases and diabetes mellitus is the number one largest complication specifically in the oral cavity [11]. 80% of patients with diabetes mellitus have problems with their gums.

Signs of *periodontitis* include patients complaining that their gums bleed easily, the color of the gums becomes shiny, the texture of the skin is *stippling*, the gum pockets become deep, and there is bone damage around the teeth, the patient complains that the teeth are shaky so that they come off easily [12]. Maintaining the condition of periodontal tissue, especially in people with diabetes mellitus, is one part of preventing the occurrence of disease *periodontitis* is like bone damage around the tooth so that the patient complains that the tooth is shaky so that it comes off easily [13].

The effects of diabetes mellitus on periodontal tissue damage have been widely exposed. The severity of the condition of periodontal tissue will increase if the patient does not lead a healthy lifestyle and feels indifferent to the health condition of his teeth and mouth [5]. The behavior of people with diabetes mellitus in maintaining dental and oral health plays an important role as an effort to prevent the disease from becoming severe [14]. Preventive measures such as regular brushing, *flossing,* and regular dental health check-ups must always be considered, as they can not only prevent complications due to diabetes mellitus but can also reduce the morbidity rate due to oral manifestations of diabetics [6].

People with diabetes mellitus have a high enough prevalence to experience periodontal tissue damage. Periodontal tissue damage will be worse if the patient does not have good knowledge and behavior to maintain the health of his teeth and mouth. Good knowledge and behavior about the importance of maintaining healthy teeth and mouth will reduce and even prevent the side effects of diabetes mellitus for sufferers. Along with the increasing number of people with diabetes mellitus and the importance of dental and oral health, especially periodontal tissue in patients with diabetes mellitus [15].

The results of this study show that in patients with diabetes mellitus, the average periodontal tissue experiences deep pockets. This is in accordance with the results of the study that used the analysis of the chi square *test*, a *p-value* of 0,002 was obtained that was smaller than alpha 0,05, so it can be analogized that there is a significant relationship between patients with diabetes mellitus and periodontal conditions at Prolanis Kersanagara Health Center, Tasikmalaya City.

This research is in line with research conducted by Rikawarastuti which states that if

diabetes mellitus is not controlled, there will be a severity of periodontal tissue [16]. Periodontal disease is a state and degeneration of the soft tissues and supporting bones of the teeth and is chronic, cumulative, and progressive [17]. Etiological factors in periodontal disease include bacteria in plaque, calculus, materia alba, and food debris. Nonetheless, some systemic diseases such as diabetes mellitus and certain disorders can decrease or alter the host's defenses and response [18]. Uncontrolled diabetes mellitus can weaken the immunity of periodontal tissue, on the other hand, untreated periodontal disease will worsen the blood sugar balance so that periodontal tissue damage will occur [19].

Provide counseling to respondents about periodontal tissue health and conduct control at the nearest health care facility [20]. Motivational counseling interventions in dental health are most commonly performed in patients with periodontal disease [21].

Efforts to prevent periodontal disease by understanding the importance of maintaining a regular and thorough oral care routine. Brush your teeth twice a day, use *dental floss* daily, clean your tongue with a tongue cleaner every day, and use *mouthwash*, try to quit smoking, the patient is constantly under the supervision of a doctor to keep blood glucose levels under control and reduce the risk of diabetes and dental support tissue disease.

Conclusion

There is a significant relationship between diabetes and periodontal condition in the Prolanis Kersanagara Health Center, Tasikmalaya City.

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