

## **DURATION OF DIABETIC CORRELATED DISEASES WITH DIABETIC FOOT ULCERS AT DR MOEWARDI HOSPITAL OF SURAKARTA**

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### **Abstract**

The duration of diabetes disease can make non-adherent patients in the management of diabetes. Lack of proper diabetes management will cause complications. One of the complications that affect the patient's quality of life is foot ulcer. The purpose of this study was to find the relationship between the duration of disease and diabetic foot ulcers. This research used observational analytic study with case-control methods. It used purposive sampling in 34 diabetes mellitus patients with foot ulcers and 34 diabetes mellitus patients without foot ulcers. The research instruments were the use interview about the duration of diabetes and the observation of foot ulcer of diabetic patients. The result showed there was no relationship between the duration of disease and the incidence of foot ulcers in the Dr. Moewardi hospital. The respondents who suffered from diabetes for more or equal to five years had the possibility of ulceration of 1.895 times compared with the respondents who suffered from diabetes for less than five years. The research recommended the necessity of organizing screening and education about foot ulcer on diabetic patients.

**Keywords: foot ulcers, lenght of disease, diabetes mellitus**

### **Presenting Author's biography**



Okti Sri Puwanti. Had been working for twelve years at the School of Nursing, Faculty Health Science, Universitas Muhammadiyah Surakarta. Her research interests are medical surgical nursing, especially on diabetes mellitus.

### **BACKGROUND**

Traditional lifestyle changes to modern lifestyle, fast food, overeating, lack of exercise, the increasing number of elderly in Indonesia contributed to the increased risk of diabetes mellitus [1]. The prevalence of Diabetes in the World in 2000 was 171 million people, and is projected to be 366 million people by 2030 [3]. The prevalence in the United States stated that there were 25.8 million patients with diabetes mellitus comprising of children and adults, 18.8 million people were diagnosed with diabetes, while 7 million people remain undiagnosed of diabetes mellitus. In 2004, diabetes mellitus patients who developed complications of heart disease increased by 68%. In 2005-2008, the patients diagnosed with diabetes aged 20 years

and over who had hypertension / greater or equal to 140/90 mg/dl and received treatment of hypertension were 67%. The complications of blindness in 2005-2008 showed that there were 4.2 million people with diabetes mellitus aged  $\geq 40$  years or 28.5% had retinopathy and nearly 0.7 million people (4.4%) had retinopathy with severe vision loss. Diabetes mellitus patients with complications of kidney failure reached 44% in 2008, with 48,374 people started treatment of chronic renal failure and 202,290 of diabetes mellitus patients with chronic renal failure who were living with dialysis or kidney transplant. About 60-70% of patients with diabetes mellitus had neuropathy, and more than 60% of patients were non-traumatic amputated due to diabetes [2]. In 2000, the numbers of diabetes mellitus in Indonesia reached 8.426 million people, and the number is estimated to increase to 21,257 million inhabitants in 2030 [3].

Several studies found that patients had ever suffered from diabetes until developing foot ulcer, according to Promper *et al.* & Peters *et al.* [4, 5] reported that the duration of diabetes mellitus for  $> 10$  years, while according to Alex *et al.* & Melville *et al.* [6, 7], the incidence of recurring ulcer 35-40% with previous ulcer history, in diabetes mellitus patients for  $>3$  years. In contrast to the above opinion, a study from Nyamu *et al.* [8] stated that there was an average duration of 7.98 years diabetes mellitus to ulceration, while also stated that patients suffering from diabetes with the duration of 13.2 years. Unlike the conducted study by Nyamu [8], the duration of diabetes mellitus average of 5 years until an ulcer complications occurred in 1000 person. The data could be obtained with a structured interview to the patient. The background encouraged the objective of this research, which aimed to know the relation between patients with diabetes mellitus with the duration of  $\geq 5$  years and the occurrence of foot ulcers at the Dr. Moewardi Hospital Surakarta.

## **LITERATURE REVIEW**

The risk factors of ulcers are peripheral neuropathy, vascular disease, limited joint mobility, foot deformities, increased foot pressure, minor trauma, a history of ulcers or amputation, and impaired visual acuity [9, 10]. Further study discussed that the risk factors for ulcers and amputations were male, smoker, suffering from diabetes for more than 10 years, bad control of blood sugar, and a history of foot ulcers or amputations before, as well as other complications such as neuropathy periphery [11]. The estimate incidence of clinical neuropathy reached 10% to 20% in patients with Diabetes Mellitus. However, this percentage could be increased by as much as 50% after twenty-five years of suffering from diabetes [12]. The risk of PAD suffered by almost 50% in people with diabetes for more than 20 years [11]. In contrast, another study reported that the average duration of diabetes of 6-7 years certainly developed into a foot ulcer [8]. Meanwhile, according to Melville [7], recurrent ulcers occurred about 35-40% of the duration of diabetes mellitus for over 3 years and 70% for over 5 years of suffering from diabetes. Unlike a study conducted by Nyamu [8], the average duration of diabetes mellitus for 5 years until an ulcer complications happened in 1000 person.

## **METHODS OF RESEARCH**

The research applied design case control, purposive sampling technique, by taking 34 sample cases of patients with foot ulcers and 34 samples of patients who did not experience foot ulcers. The inclusion criteria were patients with diabetes who had foot ulcers since May

to November 2012, good long-term memory, and willing to become respondents for this research. The exclusion criterion included patients who experienced loss of consciousness. The research instrument for the duration of diabetes mellitus was conducted by using interview, while the incidence of foot ulcers was done by observation. The analysis of data applied chi square.

## RESULTS AND DISCUSSION

The results of research could be seen in Table 1

**Table 1.** Relationship between uration of diabetes disease and foot ulcer diabetes

Duration of Disease	Foot ulcer diabetes				<i>p value</i>	OR	CI 95%	
	No foot ulcer		Ulcer				Min	Mak
	n	%	n	%				
< 5 years	15	44,1	10	29,4	0,157	1,895	0,696	5,157
≥ 5 years	19	55,9	24	70,6				
Total	34	100	34	100				

Based on Table 1, it showed that respondents with the duration of diabetes mellitus disease more than or equal to 5 years experienced more ulcers as much as 70.6%. On the other hand, the respondents who suffered from diabetes for more or equal to 5 years old who did not have ulcers only reached 55.9%. The statistical analysis showed that there was no correlation between the duration of diabetes mellitus for  $\geq 5$  years old with the incidence of foot ulcers ( $p$  value = 0, 157). The duration factor of  $\geq 5$  years of suffering from diabetes served as a risk factor, because the value of  $OR > 1$ . The results showed that  $OR$  1.895 ( $CI = 0.696$  to  $5.157$ ); it demonstrated that the respondents who suffered from diabetes for more or equal to 5 years had the possibility of ulceration 1.895 times higher, if compared to the respondents who suffered diabetes mellitus for less than five years.

This was consistent with a research conducted by Nyamu *et al.* [8], of respondents who experienced ulcer complications after suffering from diabetes for 5 years. According to another research, there was a greater risk of recurrent ulcers in patients who suffered from diabetes over three years, which was recorded to be 35-40% and 70% suffered from diabetes over 5 years [7]. Different research stated that patients with 6-7 years of suffering from diabetes would experience 8.5% of ulcer complication possibility [8].

The study was also in accordance with the literature, that the metabolic abnormalities in an absolute or relative deficiency that was not adequately therapy, in a few years or decades would lead to broad changes and irreversible in the body. Hyperglycemia would play an important role in this regard [13].

The changes in glucose intolerance developed into type 2 diabetes took 10 years to obesity, occurred as much as 30-40% [14]. Based on the studies, it showed that 20-30% of patients with poor blood sugar during the 5-10 years developed diabetes mellitus. Patients with random blood glucose between 5.3-5.7 mmol / L had a risk of diabetes in the next 10 years [15]. Injuries to the leg or delayed wound healing due to the data neuropathy, vascular disorders, and minor trauma could cause ulcers and even amputation. The nurse should assess the risks of foot ulcers in diabetic patients; whether they had a history of previous occurrences

foot ulcers, disruption or loss of sensation in the foot, the foot deformity, circulation, self care, and knowledge of the patient [16].

The majority of respondents suffered from diabetes mellitus with more or equal to 5 years had suffered from foot ulcers. The median value of the duration of diabetes mellitus on the respondents in this study was 6.5 years. The longer someone suffered from diabetes mellitus, the more risks of complications; and one of the complications was foot ulcers. The respondents who were newly diagnosed with diabetes mellitus or suffered from diabetes mellitus for less than 5 years showed the possibility of ulcers occurrence. This might occur because the respondent had no symptoms, they could only notice the disease after complications occur; then, the new respondents were admitted to the hospital. The respondents who were diagnosed with diabetes longer than 5 years had the possibility of suffering from diabetes long before they performed medical diagnosis. Diabetes mellitus disease is a chronic disease, however, if there was a high awareness in patients to care for themselves and to be careful in activities to prevent injury to the respondent. This study did not answer the hypothetical possibility due to uneven distribution of the data. Consequently, it took a lot of samples to answer this research question.

## CONCLUSION

It was concluded that there was no relationship between the duration of diabetes mellitus disease for  $\geq 5$  years with the incidence of foot ulcers; the duration of  $\geq 5$  years suffering from diabetes served as a risk factor, because the value of  $OR > 1$ . The results found that  $OR 1.895$  ( $CI = 0.696$  to  $5.157$ ). The research recommended that there was an importance of screening ulcers in diabetes and foot care education.

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