Original Research Article

Diabetic Foot and Self-Awareness of This Entity

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ABSTRACT

Aims: To determine the relation between the diabetic foot stages and the self-awareness about self-care of the feet in patients attending first level medical facility.
Study design: This is a descriptive, cross sectional study.
Place and Duration of Study: This study was done in the Family Medicine Unite Number 57of the Mexican institute of Social Security, Puebla, Mexico during January to June in 2017.
Methodology: We included 360 patients in whom we correlated the level of knowledge about self-care of the feet in diabetic patients and its stages. We used a questionnaire in which the variables included gender, age, level of education, occupation, marital status, number of years since they were diagnosed with diabetes mellitus type 2, stage of the diabetic foot and level of knowledge related to this entity. Descriptive statistics and X^2 were used.
Results: We included 360 patients who met the inclusion criteria. Their average age was *55.75* years, the average number of years with the diagnosis of diabetes mellitus was *6.07.* There was a significant statistic association between the level of knowledge and the stage of the diabetic foot *P = .049* a value of *P= .05* was considered statistically significant.
Conclusion: There is an association between the stage of the diabetic foot and the knowledge about the self-care of the feet.

Keywords: Diabetic foot, level of knowledge, self-awareness, Wagner Ulcer Classification System.

1. INTRODUCTION

Nowadays Diabetes mellitus is one of the mayor public health issues. Worldwide, in 2015, the International Diabetes Federation (IDF) estimated an average of 318 millions of pre diabetic patients and 415 millions of adults who had been diagnosed with Diabetes Mellitus type 2 (DM2). From the health economy standpoint, the management of this entity and its complications takes 5-20% of the health budget, which in total would count for up to 750 billions of dollars annually, with the possibility of increasing in 19% in the next 25 years. [1]

People with DM2 have higher risk to suffer from infectious diseases and other serious illnesses. The high levels of glucose in blood could lead to severe entities that affect the heart, blood vessels, eyes, kidneys, nerves and even cause periodontal issues. In countries with the world's largest economy, Diabetes Mellitus type 2 is the first cause of cardiovascular disease, blindness, kidney disease and amputation of lower extremities. [2] In western countries the incidence of diabetic ulcers is approximately 2%; however, in the United States the annual incidence varies from 5 to 6%. In addition, recent data estimates a lifetime risk of foot ulcers of 34% in diabetic patients. [3] The presence of diabetic ulcers are a complication frequently seen in patients who lack basic knowledge about this disease. Carrillo Al. and associates reported that even patients, who are members of support groups of this entity, couldn't identify the basic signs of alarm. [4]

The Wagner Ulcer Classification System is the most used for classification of foot ulcers and its stage is indicative of prognosis. It considers the presence of neuropathy, ischemia and infection. [5]

Diabetic foot ulcers and its lack of wound healing are some of the severe complications that could occur following a skin lesion in people with DM2. The foot ulcers are the most frequent cause of hospitalization, which could lead to amputation in up to 85% of the cases regardless receiving medical care. Furthermore, the ulceration affects 12 to 25% of people diagnosed with this entity at some point in their lives, which represents an important expense for the health system.

The periodic feet assessment in diabetic patients is effective to reduce the risk of amputation of lower extremities, preventing the recurrences of ulcerations, which can also be reduced when using special shoes for diabetics. The risk of complications related to diabetic ulcerations can be reduced with preventive measures, patient education and self-care of the feet. [6] We must then identify potential patients with risk of diabetic ulcers, neuropathy, macroangiopathy and infections, which are pathophysiological factors associated with this entity that affect the quality of life and increases the expenses of hospital care. [5] Some authors state that 49% to 85% of this disease could be prevented if adequate preventive measures where used.The self-care of the feet in diabetic patients is important to reduce the risk of diabetic ulcers for which the prevention of this disease should be taken in action; so diabetic patients could have a better quality of life. [7] The key is to identify patients with higher risk as well as to have qualified health providers taking care of these patients. Moreover, the promotion of general knowledge about this disease should be implemented in diabetic patients, so they can have the knowledge resources to take care of themselves.

This study was done with the main objective to correlate the knowledge of self-care of the feet and its stages in the primary care level.

2. MATERIAL AND METHODS

A descriptive, transversal study was done in patients with Diabetes Mellitus 2 who received medical attention from January to June in 2017. A non-probabilistic sampling was used with 360 patients who met the inclusion criteria such as: diagnosis of diabetes mellitus 2, willingness to participate and signed consent to participate in this study. The variables were gender, age, level of education, occupation, marital status, years since diabetes mellitus was diagnosed, stage of diabetic ulcers according to the Wagner scale, and level of self-care knowledge.

The survey of knowledge and care of the diabetic foot was used to know the level of self-awareness. This is a highly approved questionnaire used for the patients with diabetes mellitus type 2. According to the risk factors, the reliability of the instrument was determined with statistic formulas such as Ku de Richarson. The results were =0.7 which is considered valid for being higher than 0.5. [8] We also assessed the feet of the patients and classified them according to The Wagner Ulcer Classification System. Once all the measurement values were obtained we codified them and made a data matrix in which the data was processed with SPSS V 23. We used descriptive statistics as well as measures of central tendency, dispersion measures, and X^2 for the association between variables of interest.

3. RESULTS AND DISCUSSION

From the total number of respondents (360), the sociodemographic data resulted in *55.8 (201)* patients of female gender, the average age was *55.75*, the minimum age was 29 and the maximum age was *82, ± 10.210* years.
The major number of patients had: an undergraduate degree *(n=108),* the average occupation was housewive *(n=136),*and married marital status *(n=174).* (See table 1)

Table 1. Socio-demographic characteristics.

Level of education	**n**	**%**
Illiterate	4	1.2
Elementary school	100	27.6
Middle School	77	21.4
High School	71	19.8
Undergraduate	108	30
Occupation	**n**	**%**
Housewive	136	37.8
Other	120	33.3
Laborer	42	11.7
Retired	34	9.4
Unemployed	17	4.7
Farmer	11	3.1
Marital Status	**n**	**%**
Married	174	48.3
Free union	101	28.1
Widowed	58	16.1
Divorced	14	3.9
Single	13	3.6

The average years of diabetes mellitus type 2 being diagnosed was *6.07*, minimum *1*, maximum *30, ± 4.517*. These patients had diabetic ulcer grade 0 in *98.3% (n=354)* and only *1.7% (n=6)* had grade 1 according to the Wagner classification. The level of self-awareness of self-care of the feet was below *35.9% (n=129),* medium *51.9% (n=187),* high *12.2% (n=44).*

When correlating the level of knowledge of self-care and the stage of diabetic ulcers a value of X^2*=6.050, P=0.049* was found. Therefore, we conclude that there is a relation between the stage of diabetic ulcers and the awareness about the self-care of the feet in patients of the Family Medicine Unite Number 57, Mexican institute of Social Security, Puebla, Mexico. [See table 2].

Table 2. Correlation of the level or knowledge of diabetic foot and its stages.

Level or knowledge	**Stage of diabetic foot**		**TOTAL**	
	Grade 0	**Grade 1**		
Low	*124*	*5*	*129*	

Medium	*186*	*1*	*187*	**P=.049**
High	*44*	*0*	*44*	
TOTAL	*354*	*6*	*360*	

Self-awareness of patients with Diabetes Mellitus type 2 is essential for the control and prevention of complications that could lead to amputation of lower extremities. Foot ulcerations are the result of a combination of multiple factors such as age, sex, ethnicity, duration of the diabetes, peripheral neuropathy, peripheral artery disease, deformity, repetitive minor trauma and past foot ulceration or amputation. It has been shown that patients with previous foot ulcers, have a risk of recurrence in up to 50% of the cases. [3]

Sensory loss as a result of peripheral neuropathy triggers a higher risk of developing foot ulcers. It has been shown that up to 60% of diabetic patients have neuropathy, which results in a lack of the musculature of the foot leading to atrophy with muscle wastage and foot deformities that create areas susceptible to trauma that are often unnoticed by the patients and therefore, a higher risk of developing foot ulcers. [9] In addition, the repetitive plantar pressure, trauma, shear forces from ambulation, loss of sweat and malfunction of the sebaceous glands create a keratinized and dry skin that results in abnormal blood flow in the feet threating to higher risk of cracked skin, and foot ulcers that could result in infection and amputation as the final complication. [9] Therefore, in this study we aimed to determine the self-awareness about self-care of the feet in 360 patients with diabetes mellitus type 2 who met the inclusion criteria. The results showed a higher incidence in the female gender with *55.8%*, which agrees with some research studies that have been reported. [10] Other studies showed a higher percentage of *64.7%* of women with this entity. [11]

The average age and years of diabetes mellitus being diagnoses was *55.7* and *6.07* respectively. Lopez L and associates showed similar data, in which the average age was *52.6 ± 5.8* years and the average years with diabetes mellitus was *112.00 (9.3 years).* [11] In contrast, in a study done by Alonso F. the average age was *68.9* years. Rodrigues H and associates showed an average age of 44.6, and an average of *10.6* years of being diagnosed with DM2. [12,13]

The level of education was undergraduate studies in *30% (n=108).* Also, married was the most frequent marital status *48.3% (n=174).* On the other hand, in a study published by Rodrigues H the level of education was incomplete elementary school in a *65.9%* along with married marital status of *56.1%*. (13) Moreover, Perez R, reported a higher percentage of unfinished elementary school in *46.8%*. [14]

The average occupation was housewives *37.8% (n=136)* probably due to a higher population of women in this study. Perez R and associates reported that *76.6%* of its participants were also housewives. (14) According to the Wagner classification, grade 0 showed *98.3% (n=354)* and *1.7*% presented grade 1. [7] Nevertheless, Matute M and collaborates reported more frequent cases with grade 2 in *26.5%* and grade 3 in *20.5%.* [15]

In addition, the average self-awareness of the feet care was *51.9% (n=187)* unlike Perez R and associates who showed an average of 55.8%, similar to Sanchez U who reported an even higher percentage of *95.%* in his study. [16]

4. CONCLUSION

We can conclude that the stage of diabetic foot is related to the self-awareness of self-care; therefore, we should focus on patient education of diabetic patients, so they get to know this entity and know how to take care of their health to prevent complications, especially diabetic ulcers that can be prevented with the proper prevention measurements.

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COMPETING INTERESTS

None of the authors have any conflicts of interest disclose.

AUTHORS' CONTRIBUTIONS

All authors read and approved the final manuscript.

CONSENT (WHERE EVER APPLICABLE)

Not applicable.

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

The ethics committee approved this study.

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DEFINITIONS, ACRONYMS, ABBREVIATIONS

None.

APPENDIX

None