

The Effect of Demographic Data and Hemoglobin A 1c on Treatment Outcomes in Patients with Diabetic Foot

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ABSTRACT

Objective: Diabetes mellitus, the most common cause of non-traumatic foot amputations, is a life-threatening condition due to its high mortality and morbidity. In our study, we retrospectively evaluated our patients with diabetic foot syndrome in our clinic. **Materials and Methods:** The demographic data, duration of diabetes, Wagner classification, haemoglobin A 1c (HbA1c) levels, white blood cell, C-reactive protein sedimentation levels, hospital stay, and treatment results were evaluated retrospectively in 14 patients with diabetic foot between January 2017 and December 2018. **Results:** The mean age of the patients was 62.43 ± 7.7 years. Of the 14 patients, 3 were females and 11 were males. All 14 patients were type 2 diabetes mellitus. When diabetic foot Wagner classification was performed, 6 patients were evaluated as Wagner 2, five patients were Wagner 3, and three patients were evaluated as Wagner 4. Nine patients had complete amputation and 3 had vascular surgery. **Conclusion:** Although the level of HbA1c is below the target level, the risk of diabetic foot is increased when there is no adequate diabetes mellitus foot training. Inadequate diabetic patient education and hospitalization of patients after infection progress the amputation rate.

Key words: Diabetes mellitus, diabetic foot, hemoglobin A 1c, Wagner classification

INTRODUCTION

Diabetic foot is an important public health problem that can cause serious morbidity and mortality. Multiple factors play a role in the development of foot ulcers. Peripheral sensory neuropathy, peripheral arterial disease, and foot traumas, which are the late complications of diabetes, are the main causes of ulcers. Motor and autonomic deficits due to neuropathy also contribute to the development of ulcers. Diabetic foot constitutes 50–70% of non-traumatic amputations. Diabetic foot prevalence is reported to be between 5% and 10%.^[1-4]

MATERIALS AND METHODS

Demographic data, diabetes duration, Wagner classification, haemoglobin A 1c (HbA1c) levels, white blood cell, C-reactive protein, sedimentation levels, duration of hospitalization, and

treatment results were evaluated retrospectively in 14 patients with diabetic foot between January 2017 and December 2018. The patients who needed complete amputation and needed vascular surgery after antibiotherapy were evaluated according to their clinical and laboratory values. Wagner in diabetic foot classification; Stage 0: Bone projection and/or callus formation with severe skin (risk for ulceration), Stage 1: Superficial ulcer without deep tissue metastasis, Stage 2: Tendon, deep ulcer with bone, ligament or joints, Stage 3: Abscess and or deep ulcer containing osteomyelitis, Stage 4 Gangrene, holding the fingers and/or metatarsals, Stage 5: It was evaluated as the gangrene of the heel or foot which could not be recovered and required amputation.^[5]

RESULTS

In this study, clinical and laboratory values of 14 diabetic patients followed in 2017 and 2018 were evaluated

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retrospectively. The mean age of the patients was 62.43 ± 7.7 years. Type 2 diabetes mellitus was present in the patients. The mean HbA1c of the patients was 8.7 ± 1.1 . The mean duration of diabetes mellitus was 15.3 ± 5.4 years. There was diabetic nephropathy in 10 patients. When diabetic foot Wagner classification was performed, six patients were evaluated as Wagner 2, five patients were Wagner 3, and three patients were evaluated as Wagner 4. Amputation was performed in two patients with antibiotherapy, and vascular surgery was required in three cases. The mean hospitalization time was 7.5 ± 4.1 days [Table 1 and Figure 1].

DISCUSSION

It has been reported that there is a risk of developing diabetic foot ulcer in 12–25% of patients with diabetes mellitus. Current status is important in terms of morbidity and mortality. Because diabetic foot ulcers without treatment

can cause life-threatening morbidity and mortality. The high cost of treatment in the patient with diabetes is the reason of hospitalization and longest hospital stay. In our study, the mean duration of hospitalization was 7.5 ± 4.1 days. It has been shown that the risk of relative death increases approximately 2.5-fold in diabetic patients with a new ulcer on his feet.^[6-8] It is known that amputations are more common in men due to diabetic foot.^[9,10] In our cases, male patients (78.6%) were the majority. Two cases of amputation were males. Neuropathy which is accepted as the most important risk factor for diabetic foot syndromes was found to be as high as 100% in our cases. This rate was reported as 61–100% in the literature.^[11] In patients with diabetic foot syndrome, the rate of amputation was determined by Ozkan *et al.*^[12] 42.95%, Hekimsoy *et al.*^[13] 41%, Arslan *et al.*^[14] 21%, Savaş *et al.*^[15] 48%, Gökel *et al.*^[16] 35%, and Eren *et al.*^[17] 41.46%. In our study, foot/knee amputation was applied to 14%. An increase in the rate of amputation is considered as an important factor for late application. 57.1% of our patients were in Stage 3 and above when they applied to the hospital. The presence of uncontrolled diabetes mellitus is an important factor in the development of diabetic foot ulcers. In addition, diabetic foot training is important in preventing the development of foot ulcers. In one patient, although HbA1c level was 6.9%, it was seen that he had an amputation for diabetic foot ulcer. Although this patient had been given diabetic foot training before, it was learned that he did not fulfill the requirements of education.

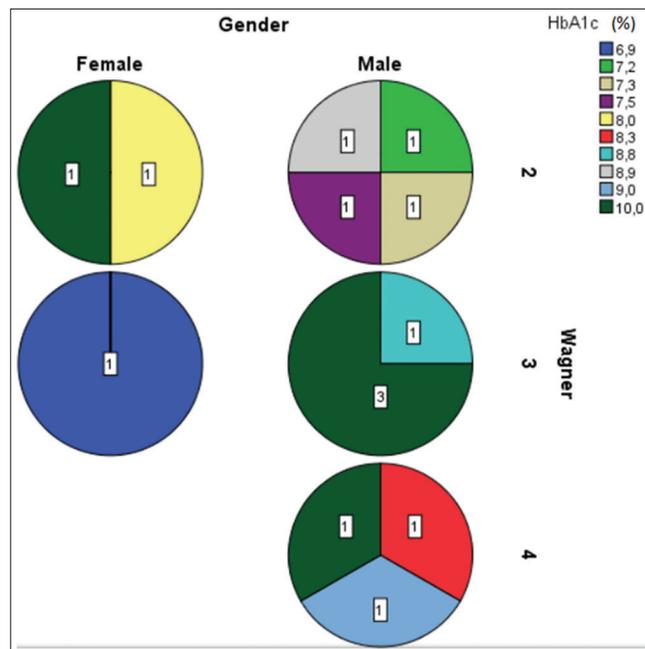


Figure 1: Diabetic foot Wagner classification by hemoglobin A 1c and gender

Table 1: Demographic and biochemical characteristics of patients with diabetic foot

Age (Average year)	62.43±7.7
Gender (Female/male)	3/11
HbA1c (%)	8.7±1.1
WBC (mm ³)	13414±4957
CRP	14.1±12.9
Sedimentation	62.3±23.8
Hospitalization days	7.5±4.1

HbA1c: Hemoglobin A 1c, WBC: White blood cell, CRP: C-reactive protein

CONCLUSION

Although the level of HbA1c is below the targeted level, the risk of diabetic foot also increases when there is not enough diabetes mellitus foot training. Inadequate diabetic patient education and hospitalization of patients after infection progress the amputation rate.

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How to cite this article: Durmaz SO, Celik M. The Effect of Demographic Data and Haemoglobin A 1c on Treatment Outcomes in Patients with Diabetic Foot. *Clin Res Diabetes Endocrinol* 2018;1(2):1-3.