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Survival of diabetic and non-diabetic patients who underwent major amputation of the lower limb on the basis of data collected by the National Health Fund in 2008 - 2013

Streszczenie w języku angielskim

Introduction:

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from a defect in insulin secretion and or its action. According to data published by the World Health Organization (WHO) in 2014, there were 422 million adults with diabetes in the world (compared to 108 million in 1980). According to information contained in the national profile of Poland, which is part of the first World Diabetes Report by WHO, diabetes causes 2% of all deaths in the country.

Diabetes is associated with numerous complications resulting from micro and macroangiopathic and metabolic disorders. A major complication of diabetes is diabetic foot ulcer a possible result of which lower limb amputation. In the treatment of diabetic foot syndrome, there is always a tendency to minimize the number of amputations, and if necessary efforts are made to reduce the extent of amputation.

Chronic complications of diabetes pose an enormous clinical problem, they necessitate numerous and long hospitalizations, are the leading cause of death among patients, and cause a great financial burden for the sick and for the state.

Since the early 1990s, a number of publications have been published on the risk factors for amputation in patients with diabetic foot. They included age, male gender, presence of ulcer, presence of neuropathy, presence of multifocal peripheral arterial disease, high blood pressure, need for renal replacement therapy. However, the results presented concern not only different populations: North American, European, different health care systems but also the number of trials on which the study is based.

Aim of the study:

The main goal is to determine the chance of surviving diabetic and non-diabetic patients who underwent the first major amputation of the lower limb for the first time in a given year.

An additional objective of the study is to determine the effects of other diseases such as chronic kidney disease, myocardial infarction, and subsequent amputation as a predictor of death of patients with amputation of the lower limb. Another goal was also to develop an algorithm that would be used in clinical practice to identify patients requiring urgent referral to a diabetic foot treatment center as well as to classify the patient according to certain attributes.

Material and methods:

The study group consisted of patients reported by the health care providers to the National Health Fund from January 1, 2008 to December 31, 2013, and their data were collected in Payer's database systems. The first group comprised patients after amputation of the lower limb due to diabetes and patients who were reported to have taken any type of antidiabetic medications or diabetic treatment prior to amputation.

Among patients without diabetes (with normal glucose tolerance) were patients after amputation of the lower limb for reasons other than diabetes. Amputations occurred at the same time in both groups. From both amputations group have been eliminated for the reasons of various injuries.

Statistical analysis included 23 629 patients with diabetes after amputation of the lower limbs, including 14,000 men and 9 629 women aged 19-104 (mean age 70.38 ± 11.28 years) and 17,818 non-diabetic patients including 12,124 men and 5 694 women between 11 and 105 years of age (mean age 69.82 ± 13.79 years).

The groups were observed "toward the present" in terms of the endpoint defined as patient's death or the end of the observation. In addition, specific parameters were measured during the study: age, sex, municipality of residence, history of myocardial infarction, ischemic renal disease, stroke. The results were calculated using the following methods: Kaplan-Meier analysis, Student's t-test. The association of individual variables with death was assessed by

using logistic regression analysis. The decision tree model was used to find an algorithm to classify a patient into a risk group.

Results:

The result of the study show that the risk of death was lower in patients with diabetes. Median survival was 28.6 months for diabetic patients and 21.43 for non-diabetic patients. This work has shown that the most important independent risk factors for death after amputation of the lower limbs in diabetic and non-diabetic patients are renal failure, stroke, myocardial infarction, amputation, and end-stage renal failure. This study also identified additional risk factors such as age, female gender.

Conclusions:

The risk of death in the group of patients undergoing lower limb amputation was higher in non-diabetic patients than in patients with diabetes mellitus. In both groups, there was a large difference in median depending on sex. The risk of death among patients with diabetes was 10% higher for women than for men and 13% higher for non-diabetic women, compared to non-diabetic women.

With every year after amputation, the risk of death increased by 4% in diabetic patients and by 4.4% in non-diabetic patients. Patients with renal insufficiency either with or without diabetes had a higher risk of death than patients without this insufficiency. Patients with end-stage renal disease showed an increased risk of death with diabetes of more than 100% without diabetes by 92% in contrast to those who were not dialysed in this direction.

Stroke in patients with diabetes increased the risk of death by nearly 30% compared to those who did not have a reported illness. The risk of death in non-diabetic patients after stroke was greater by nearly 20% than in those without stroke. Myocardial infarction increased the risk of death by 6% in diabetic patients, while in non-diabetic subjects there was no significant effect on the risk of death.