Factors Associated with Major Amputation in Diabetic Foot Patients: A Nationwide Study

Dongwoo Shim[1], Wonwoo Lee, Yeo Kwon Yoon, Kwang Hwan Park[2], Seung Hwan Han[3], Jin Woo Lee[2]
[1]Orthopaedic Surgery, Yonsei University Severance Hospital, [2]Yonsei University College of Medicine, [3]Gangnam Severance Hospital

INTRODUCTION:

Diabetic foot is prevalent in 60-70% of diabetic patients, often necessitating amputation depending on its severity. Major amputation, in particular, not only affects the quality of life but also has implications for mortality rates. Therefore, understanding the risk factors is crucial. In this study, we aimed to analyze the risk factors associated with major amputation in diabetic foot patients, distinguishing them from minor amputations.

METHODS:

This study utilized nationwide cohort data from the Korean National Health Insurance Service (NHIS) spanning from 2002 to 2020. Patients with a diagnosis code for diabetic foot (E107-147) who underwent limb amputation procedures (N0571-0575) were extracted and classified into minor and major amputation groups (Minor vs. Major). Comparative analyses were then conducted on gender, age, income level, lower limb vascular reconstruction, antibiotic use, diabetes medication type, comorbidities, mortality rates, and time until death, among other variables, using health insurance data. Subsequently, logistic regression analysis was performed to investigate the relative risk of each factor.

RESULTS:

There were 40,809 cases of limb amputation, with both minor and major cases gradually increasing (Figure 1). The Major group, with a higher proportion of older males, had lower income levels, more frequent lower limb vascular reconstructions, and top-tier antibiotic use. They also had higher rates of comorbidities such as hypertension, cerebrovascular disease, end-stage renal disease (ESRD), congestive heart failure, ischemic heart disease (IHD), and dementia. During the observation period, this group had a higher mortality rate and a shorter time until death. Logistic regression analysis identified significant risk factors in the Major group, including top-tier antibiotic use, age over 50, ESRD, dementia, IHD, and lower limb vascular reconstruction in order (*all results were significant at $P < 0.001$).

DISCUSSION AND CONCLUSION:

Through a nationwide cohort study, major amputation in diabetic foot patients was associated with higher mortality rates and shorter time until death. Multidrug-resistant bacterial infection, old age over 50, ESRD, dementia, and IHD were identified as risk factors contributing to the risk of major amputation.