

# Being divorced and male among factors that increase risk of lower limb amputation among people with diabetes

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New research to be presented at this year's Annual Meeting of the European Association for the Study of Diabetes ([EASD](#)) in Hamburg,

Germany (October 2–6) shows that among people with type 1 and type 2 diabetes, being divorced is associated with a two-thirds higher risk of lower limb amputation (LLA) (amputations below the knee level) compared with being married, and being male is associated with a 57% higher risk of LLA compared with being female.

The study is by Dr. Stefan Jansson, Örebro University, Örebro, Sweden, and colleagues.

Deterioration in the structure of both large and [small blood vessels](#) (macrovascular and microvascular complications) is common among people with [diabetes](#), especially among those who are less adherent to diabetes medications to lower blood sugar, blood fats and blood pressure. Rates of LLA have been declining for a number of years as diabetes treatment and control has improved.

Risk factors for [lower limb amputation](#) (LLA) in individuals with diabetes have been under-studied. In this study, the authors examined how demographic and socioeconomic, medical and [lifestyle risk factors](#) may be associated with LLA in people with newly diagnosed diabetes.

The authors used Swedish national register-linked data and identified, through the Swedish national diabetes register, all individuals 18 years or older with an incident diabetes diagnosis and no previous amputation from 2007 to 2016. These individuals were followed from the date of the diagnosis to amputation, emigration, death, or the end of the study in 2017, whichever occurred first. In this study, 98% of participants had type 2 diabetes, and 2% type 1 diabetes.

Several national Swedish registers were used to obtain data on incident LLA and potential risk factors, including demographic and socioeconomic, medical and lifestyle variables. Variables with more than 40% missing data were excluded from the analysis. The cohort consisted

of 66,569 individuals, of whom 133 had an amputation during the median follow-up of four years. Computer modeling was used to identify associations of the potential risk factors have with LLA incidence.

The authors found that being divorced compared with being married was associated with a 67% higher risk of LLA, and being male compared with being female was associated with a 57% higher risk of LLA. Each year of additional age was associated with an 8% increased risk of LLA.

The authors suggest the higher risk of LLA in divorced people may be due to a change in [self-care](#) and food habits observed in people when they divorce and are more likely to be living alone. Specifically with men, this is often related to more social isolation with a secondary effect of low physical activity.

Individuals with an increased foot risk at baseline had a higher risk for LLA compared to individuals with healthy feet (neuropathy/angiopathy—four times increased risk, previous wounds (ulcers)—eight times increased risk; ongoing severe foot disease—11 times increased risk.

Insulin treatment compared with diet-only treatment was also associated with double the risk of LLA. Hypertension and HbA1c (a way of measuring [blood sugar](#) control) were not statistically significantly associated with LLA risk. People with obesity had a less than half the risk (46%) of LLA of people with normal weight, while smokers had double the risk of LLA compared with non-smokers. Finally, low physical activity (less than once per week) was associated with double the risk of LLA compared with daily physical activity.

As this is an observational study, the authors cannot be sure about why there is a lower risk of LLA in people living with obesity. The authors

say that this could be down to chance, or a real effect because people with obesity experience more foot ulceration (foot ulcers are by far the most important risk factor for LLA), but they might have better wound healing than individuals with lower body mass through better mobilization of endothelial progenitor cells, as is the case among people living with obesity but without diabetes.

Also, some people of [normal weight](#) may have lost weight due to illness (reverse causality) putting them at a higher relative risk of LLA.

The authors say, "This study found a higher risk for LLA among people with higher age, male sex, who were divorced, who had a higher foot risk group, who were on insulin treatment, lower physical activity levels, and those who were smoking. Obesity was associated with a lower risk for LLA. Thus, these variables may have important roles in LLA risk among individuals with diabetes."

They add, "Lifestyle variables have a strong association with LLA, and an increase in physical activity, avoidance of being underweight and smoking cessation may be impactful interventions to reduce the risk of LLA. Early lower limb complications after a diabetes diagnosis or complications present at diagnosis are warning signs, and these patients should be given extra attention."

"The duration of diabetes versus higher age have been debated as risk factors for LLA. We found that older age is associated with a higher risk for LLA even in persons with a short duration of diabetes; thus, older persons with diabetes should receive extra attention even if the disease duration is relatively short."

Provided by Diabetologia

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