

Diabetic wound healing and foot ulcers

Written by Danielle Nicholson

Reviewed by Prof. Tim O' Brien, National University of Ireland Galway



One prevalent complication associated with both type 1 and type 2 diabetes mellitus is delayed wound healing. If this occurs in the legs and is left untreated, non-healing diabetic wounds can lead to infection, amputation and even death. Foot ulcers refer to a patch of skin loss on the foot. When blood sugar levels are high or left to fluctuate over extended periods, skin that normally heals may not properly repair itself because of nerve damage and reduced blood supply. Diabetes mellitus is the leading cause of non-traumatic lower limb amputation. In fact, 80% of amputations are preceded by diabetic foot ulcers.

While prevention is a major priority, improved treatments for established ulcers are urgently required. Current state of the art treatment includes cleaning the wound, ensuring good blood sugar and pressure control, treating infection, improving blood supply and relieving pressure on the wound site. Despite a clear and unmet medical need, there are currently few treatments available that are effective in accelerating wound closure in people with diabetes.



Did you know?

Up to 15- 25 % of all people with diabetes develop a foot ulcer at some point. Closely linked to diabetic neuropathy and nerve pain, even a mild injury can result in a foot ulcer.

Why are diabetic patients more likely to get foot ulcers?

Those with diabetes may have a reduction in nerve function in the extremities of the body; nerves that carry pain sensations to the brain from the feet do not function as well as they should. Wearing ill-fitting shoes, cuts, blisters, bruises and stepping on something can all develop into foot ulcers. The healing of these wounds does not occur in the typical fashion in people with diabetes as a result of narrowed arteries in the extremities and the consequent reduction of blood flow to the feet. This vascular phenomenon is known as peripheral arterial disease, PAD.

Avoiding diabetic foot ulcers is a matter of taking good care of the feet. People with diabetes should have their feet checked at least once per year by a diabetes foot care professional. They should also examine their own feet daily.



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Current treatments aim to improve circulation to the area, reduce fluid swelling and control pain in the area. Specifically, these include managing a patient's other existing diseases, wound debridement (removal of damaged tissue), pressure off-loading with mechanical devices and footwear, medicines, control of the infection, and addressing the vascular components of swelling and oedema (fluid accumulation).



Non-healing diabetic foot ulcers are typically treated topically but care needs to take a multi-disciplinary approach. Neuropathy makes the diagnosis and detection of these ulcers challenging since there is frequently no pain perceived by the patient. Vascularity and blood circulation plays a large part in the healing process. Increasing the blood supply to a wound aids healing and reduces peripheral arterial disease. Oedema needs to be considered too; the build-up of this high protein fluid is likely to affect healing.



People with diabetes who suspect that they may have a foot ulcer should speak with a doctor or podiatrist as soon as possible. Trained professionals will likely measure the size of the wound, and protect the ulcer with a dressing to prevent infection and help the skin to heal.

Diabetes influences foot ulcers in a number of ways. It is important for those with diabetes to understand the potentially severe consequences of leaving a foot ulcer untreated.

Funded by the European Commission's FP7, REDDSTAR is a three year, 10 partner project that will comprehensively examine if stromal stem cells derived from bone marrow can safely control blood glucose levels while also alleviate damage caused by six diabetic complications. www.REDDSTAR.eu

