

## **DIABETIC FOOT ULCER INFECTIONS – COMBINING THERAPY WITH PEMF AND LASER**

### **Diabetic foot ulcer infections: combining therapy with PEMFs and laser.**

I have often said that combining PEMF therapies with other modalities produces better results than either modality alone. Likewise, I have found that if one could only afford to have one system, PEMFs would likely give the most value because of the broad spectrum of conditions that can be treated and the fact that PEMFs can be used in the home setting. Many other modalities have to be delivered in the professional setting, taking the time and inconvenience of traveling to appointments and preparation for treatment. PEMF therapy does not require preparation of the patient since it goes through clothing and dressings without a problem.

The World Health Organization (WHO) estimates that there are 347 million people around the world with diabetes and one in 20 will develop foot ulcers. In addition, any leg wounds in diabetics tend to heal slowly and poorly. Conventional treatment can be frustrating and slow with many treatment failures. Because of poor circulation and reduced immune function, diabetic foot and leg ulcers are susceptible to infection, which hinders the healing process. One in 6 people with diabetic foot ulcers end up with foot or leg amputations. There are about 80,000 foot amputations annually due to DFU, or about a lower limb amputation every 30 seconds. Lower limb amputations due to diabetes are about 28 times that of any other causes. Lower limb amputations are usually the result of poor wound care. A diabetic wound that doesn't heal within 2 weeks requires more aggressive management, including PEMFs.

The benefits of PEMF therapy have been demonstrated by a recent research paper that studied the effectiveness of PEMFs in reducing the amount of bacterial infection in diabetic foot ulcers (DFU). They studied the combined use of PEMFs with laser and compared it to PEMFs

alone. Thirty (30) Type 2 diabetics with foot ulcers were randomly assigned to either the combination of PEMF and laser or PEMFs alone. The PEMF used was two Gauss (0.2 mT) at 20 Hz applied for 10 minutes for 12 treatment sessions, every other day. The PEMF group receiving infrared laser received 10 minutes of laser at the same time for the same number of sessions. In addition, all patients received standard diabetic medications and nursing care. Wound surface area was measured at the beginning and after one month of treatment. Also, the researchers measured the bacterial count in the wounds before and after treatment.

PEMF therapy alone dramatically reduced the bacterial count by 99% [from 100,000 colony units to 1000] and the combination treatment reduced the bacterial counts by 99.9% [from 100,000 colony units to 100]. This study demonstrates that PEMF therapy produces the greatest majority of the benefit in reducing bacterial contamination compared to adding infrared laser. This was accomplished with only 10 minutes of treatment over 12 treatment sessions. The results would be expected to be even better with more intensive daily treatments. Also, reducing the bacterial colony counts does not by itself indicate wound healing, but does show that it is one of the supporting reasons that PEMFs have been frequently found to speed healing of leg ulcers of any kind, including diabetic.

There is other research to support the use of PEMFs alone to reduce bacterial growth. Still other research has shown that infrared laser is better than 0.5 Gauss/20 Hz PEMF, as opposed to what was seen in this study. So, it appears that increased intensity of the PEMF makes a bigger difference. This is supported by research on the simulation effects of PEMFs on adenosine, which increases the effectiveness of white blood cells to fight inflammation and hence infection. See the blog .

While this study only looked at bacterial counts in diabetic foot ulcers, and not the actual healing of the wounds, other research supports the use of PEMF

therapy in speeding foot ulcer healing. As it is, PEMFs have a dramatic effect on safely and easily reducing bacterial contamination in diabetic wounds, which will lead to significant delays in wound healing. There is considerably more discussion about the value of PEMFs in wound healing in my book, "Power Tools for Health: how magnetic fields [PEMFs] help you." PEMFs speed wound healing through many mechanisms including the reduction of inflammation, stimulation of stem cells, fibroblasts and collagen production and the growth of new blood vessels which help the growth of new tissue, all of which repairs and closes the wound.

I had a patient with a chronic diabetic foot wound that wouldn't heal despite intensive professional wound management over 2 years. Only one month of intensive daily home PEMF therapy with a portable 200 Gauss 10/100 Hz PEMF device dramatically reduced the size of the wound, eliminating the need for ongoing professional wound management.

It's possible to consider PEMF therapy in the home as a sole therapy in the case of diabetic foot ulcers, along with basic wound care, reducing the need for intensive therapy in the professional setting, reducing costs and inconvenience. Combining professional treatments with at home daily PEMF treatments would likely produce even faster and more rapid healing.

## **Reference**

Additional effect of pulsed electromagnetic fields to laser therapy on management of diabetic foot ulcer: A single blind randomized controlled trial. Elrashid NAA, Hamada A. Hamada HA, Abdelmoety AM, et al. Bioscience Research (2018) 15(4):3322-3328.