

Evaluation of the Effectiveness of the Argon Plasma Jet on Healing Process of the Wagner Grade 2 Diabetic Foot Ulcer

Authors : M. Khaledi Pour, P. Akbartehrani, M. Amini, M. Khani, M. Mohajeri Tehrani, R. Radi, B. Shokri

Abstract : Diabetic Foot Ulcer (DFU) is one of the costly severe complications of diabetes. Neuropathy and Peripheral Arterial Disease (PAD) due to diabetes are significant causes of this complication. In 10 years the patients with DFUs are twice as likely to die as patients without DFUs. Cold Atmospheric Plasma (CAP) is a promising tool for medical purposes. CAP generate reactive species at room temperature and are effective in killing bacteria and fibroblast proliferation. These CAP-based tools produce NO, which has bactericidal and angiogenesis properties. It also showed promising effects in the DFUs surface reduction and the time to wound closure. In this paper, we evaluated the effect of the Argon Plasma Jet (APJ) on the healing process of the Wagner Grade 2 DFUs in a randomized clinical trial. The 20 kHz sinusoidal voltage frequency derives the APJ. Patients (n=20) were randomly double-blinded assigned into two groups. These groups receive the standard care (SC, n=10) and the standard care with APJ treatment (SC+APJ, n=10) for five sessions in four weeks. The results showed that the APJ treatment along standard care could reduce the wound surface by 20 percent more than the standard care. Also, It showed a more influential role in controlling wound infection.

Keywords : argon plasma jet, cold atmospheric plasma, diabetes, diabetic foot ulcer

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