

Plasma Medicine: Novel Technique for Treatment of Chronic Wound

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Prevalence of diabetes and its complications is alarmingly increasing all across the world, especially in the developing countries. It is reported that currently, there is pandemic of diabetes and 347 million are living with diabetes worldwide, 15% of them being at a high risk for developing foot ulceration [1,2].

Therefore, the burden of diabetic foot ulcers is significantly increasing and it is now considered as a leading cause of infection, amputation, and hospitalization in patients with diabetes mellitus [3]. Management of foot ulcers remains a major health challenge and different treatment options are currently available for it. Therefore, it seems necessary that the effectiveness of different treatment options should be rigorously assessed.

Currently, several different interventions for treatment of DFUs are available such as: wound debridement, antibiotics, different wound dressings, topical negative pressure, hyperbaric oxygen treatment, electrical interventions, electromagnetic options, laser, shockwave, and ultrasound therapies, growth and cell biology factors, cell products and tissue engineering, bioengineered skin and skin grafts, and adjuvant therapies [4]. As a result of interdisciplinary approaches in medicine, physics, chemistry, biology and microbiology, plasma medicine has emerged as an innovative and dynamic field of research in the recent years.

This novel technique has many advantages such as minimal toxic reactions, no need for contact, being painless, self-sterilizing, non-invasive application that allows for the treatment of heat-sensitive,

inhomogeneous surfaces and even live tissue [5]. Possible underlying mechanisms of plasma, both physical and biological, include: very rapid and gentle tissue disinfection as a result of inactivation of different pathogens, precise tissue removal, and stimulation of wound healing.

It is envisaged that in the near future, cold plasma will be increasingly favored for treatment of different diseases, specifically in treatment of chronic wounds such as diabetic foot ulcer as this type of ulcer is a result of a constellation of different etiologies such as neurological and ischemic factors.

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Received December 21, 2014; Accepted December 23, 2014; Published January 02, 2014

Citation: Amini MR, Larijani B, Tehrani MRM (2015) Plasma Medicine: Novel Technique for Treatment of Chronic Wound. *J Biomol Res Ther* 4: e139. doi: [10.4172/2167-7956.1000e139](https://doi.org/10.4172/2167-7956.1000e139)

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