
The transdermal and wound healing effect of plasma activated medium

Dawei Liu ¹

¹*Huazhong University of Science and Technology, China (P.R.C)*

The skin is the outer covering of the body, and the largest human organ. The skin is also threatened by a variety of diseases. The rapid development of plasma medicine provides an approach for the treatment of skin diseases and wound. Improving the penetration depth of plasma active species in the skin is very important to develop skin disease treatment using plasma. The plasma activated water (PAW) produced by the air plasma source was used to study the transdermal penetration of the aqueous plasma activated species. These aqueous plasma activated species can penetrate the skin (mouse skin with a thickness of ~0.75 mm) through hair follicles, intercellular and transcellular routes. The pH of the PAW did not affect the penetration efficiency of the aqueous plasma active species. But the gaseous plasma activated species cannot penetrate the skin. The plasma activated oil (PAO) is a new efficient way for the wound treatment. The peroxide index concentration of PAO is ~10 times higher than traditional ozonated oil. The PAO treatment plasma treatment decreases the complete healing time by 30%. The sterilization and neovascularization is the main reason for faster wound healing of PAO. The long term storage is another advantage of PAO. The PAO is still effective in wound treatment after two months storage, which is attributed to the peroxide index of PAO decreases only ~10% after two month storage.

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